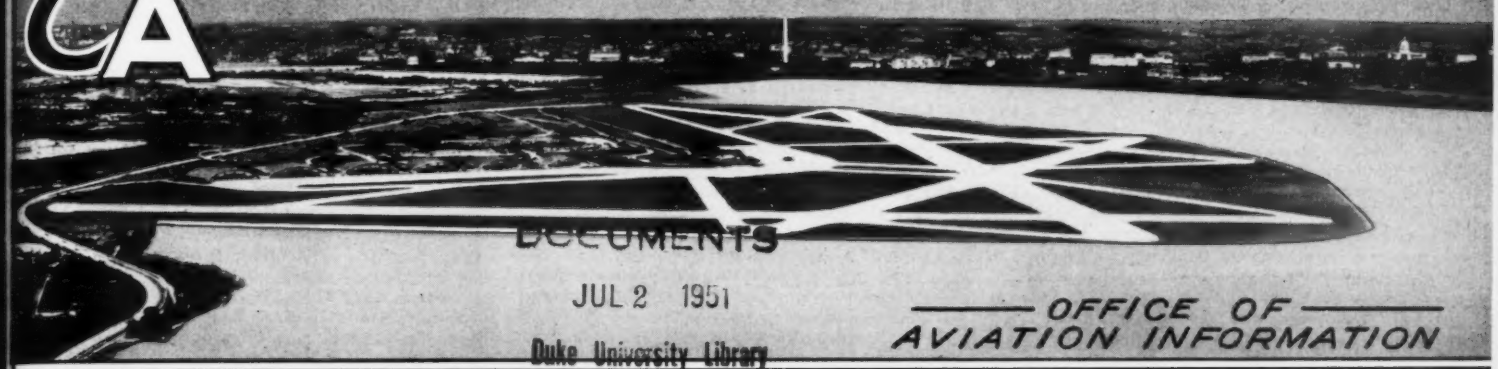
CAA JOURNAL



DOCUMENTS
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OFFICE OF AVIATION INFORMATION

25 Years of Aviation Aid U. S. Economy and Defense

During the quarter-century since the passage of the Air Commerce Act of 1926, civil aviation and the government agency charged with fostering and regulating it have won new stature as elements in the national economy and national defense.

The era of barnstorming gave way during the years beginning in 1926 to the growth of civil aviation as a business. The award of air mail contracts to private firms furnished the foundation on which our system of airline transportation was built, although today it derives the bulk of its revenue from carrying passengers.

The part played by civil aviation in the winning of World War II, and the tremendous expansion of the industry since the close of the war, have brought a recognition in the present crisis that civil aviation must be preserved and utilized.

The unprecedented growth of our military aviation in World War II could never have been achieved so rapidly without the pool of trained manpower pro-

(Continued on page 66)

Many Who Aided In CAA Founding Still With Agency

This year, marking the 25th anniversary of the organization of the Federal Government's civil aviation agency, finds 82 of the original employees continuing their work with the Civil Aeronautics Administration.

Furthermore, all who headed the various organizations which handled the civil aeronautics functions of the Federal Government during those 25 years are living and many of them are still engaged in aviation pursuits.

(Continued on page 58)

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JUL 3 1951

Message on Twenty-fifth Anniversary of CAA

By Charles Sawyer, Secretary of Commerce

THE goal of the Department of Commerce is service to the nation through service to business. In no industry are the successful results of this effort more apparent than in aviation.

When, twenty-five years ago, the Department first became active in the field of aviation, it was because of widespread recognition by the infant industry that its growth would be impossible without certain services which only the national government could provide.

The demand for those services resulted in the Air Commerce Act of 1926. Under this pioneering legislation, the Department was directed to establish safety regulations for airmen in aircraft, to set up a system of federal airways, and to foster the growth of aviation by disseminating information.

How well this mandate was carried out can be read on any graph picturing aviation trends of the last 25 years. During this quarter-century of activity, air transportation has progressed from the era of flying circuses to the era of flying boxcars. In 1926, few but daredevils flew. Today, flying is so well established as a safe, everyday means of transportation, that the airlines counted almost 18 million passengers in 1950 drawn from every strata of our economic life.

The industry itself, of course, is entitled to full credit for its achievements. But we could not have today's great air transportation system without the 70,000 miles of federal airways, along which all types of civil and military planes move swiftly and safely by means of electronic air navigation aids and traffic control. Nor could we enjoy world leadership in aviation safety —our record of 1.1 fatalities per 100 million passenger-miles of airline flying in 1950 compares with a rate of 28.2 fatalities in 1930—without the standards of airworthiness, personnel competency, and adequate operational procedures administered by the government in close cooperation with the industry.

For these achievements, the Civil Aeronautics Administration and its predecessor agencies in the Department of Commerce may well take pride. I am confident that in the next 25 years the CAA will make equally notable contributions to the advancement of American civil aviation, and add to its stature as a factor in the national economy and the national defense.

Many Veterans of CAA Founding Still With Agency

(Continued from page 57)

The birth date for the first civil aviation agency within the Federal Government usually is fixed at the enactment of the Air Commerce Act which became law on May 20, 1926. On that date, however, there were federal employees already engaged in civil aviation work, for the U. S. Airways were being laid out and fitted with aids by the Air Mail Service of the Postoffice Department.

When the Aeronautics Branch of the Department of Commerce was created, the work of building the airways was assigned to the Airways Division of the Bureau of Lighthouses, of which F. C. Hingsburg was chief and other activities, such as safety regulation and airports, were in charge of Clarence M. Young. William P. MacCracken, the first Assistant Secretary of Commerce for Aeronautics, directed both. Eventually, the jobs and the workers were transferred from Lighthouses and Postoffice to the Aeronautics Branch.

Thus it is difficult to establish a definite date on which the veterans of the CAA entered on duty. Listed are those who entered on duty during 1926 and 1927, according to records in Washington and the various Regional Offices. In one or two cases, there have been brief breaks in service, but the individuals have been so intimately connected with civil aviation that their names are included. One veteran who retired in 1951 also is included.

Setting the cut-off time arbitrarily at 1927 automatically excludes a large group of employees who were in effect working for the civil aviation agency, and not yet transferred from Lighthouses, or Postoffice. They are veterans in effect, if not by exact date. A large number of CAA employees concerned with aviation safety, or "Safety Regulation" as it was known in those days, joined the CAA in 1928.

Here are the men who headed the CAA and its predecessor organizations and the years they served:

William P. MacCracken, Assistant Secretary of Commerce in Charge of Aeronautics, from 1926 to 1927.

Clarence M. Young, Director of the Aeronautics Branch of the Department of Commerce from 1926 to 1929. Mr. Young was Assistant Secretary of Commerce for Aeronautics from 1929 to 1933.

Eugene L. Vidal, Director of the Aeronautics Branch of the Department of Commerce, later Bureau of Air Commerce, from 1933 to 1937.

Fred J. Fagg, Jr., Director of the Bureau of Air Commerce from 1937 to 1938.

Dennis Mulligan, Director of the Bureau of Air Commerce for a few months during 1938.

Edward J. Noble, Chairman of the Civil Aeronautics Authority from 1938 to 1939 and Under Secretary of Commerce from 1939 to 1940.

Robert H. Hinckley, Chairman of the Civil Aeronautics Authority from 1939 to 1940 and Assistant Secretary of Commerce from 1940 to 1942.

Clinton M. Hester, Administrator of the Civil Aeronautics Authority from 1938 to 1940. The Authority was reorganized during Mr. Hester's tenure and he became Administrator of the Civil Aeronautics Administration.

Donald H. Connolly, Administrator of Civil Aeronautics from 1940 to 1942.

William A. M. Burden, Special Aviation Assistant to the Secretary of Commerce from 1942 to 1944 and Assistant Secretary of Commerce from 1944 to 1947.

Charles I. Stanton, Administrator of Civil Aeronautics from 1942 to 1944.

Theodore Wright, Administrator of Civil Aeronautics from 1944 to 1948.

John R. Allison, Assistant Secretary of Commerce from 1947 to 1949.

Delos W. Rentzel, Administrator of Civil Aeronautics from 1948 to 1950, and now Undersecretary of Commerce for Transportation.

Donald W. Nyrop, Administrator of Civil Aeronautics from 1950 to May, 1951, and now Chairman of the Civil Aeronautics Board.

Charles F. Horne, Administrator of Civil Aeronautics from May, 1951 to date.

Here are the men and women whose service with the CAA reaches back to 1926 and 1927 as reported by the various offices:

Washington Office—Arthur J. LaBaie, Mildred S. Llewellyn, Stafford Kernan, William Boesch, John E. Sommers, Abbie P. Pfeiffer, Eugene Sibley (retired 1951), John F. Teunisson, Cornelia F. Muddiman, Edith K. Hallock, Cletus M. Estep, Julia C. Hevener, Wesley Huntress, James L. Kinney, George M. Bailey, Grace M. Oberholtzer, Katherine M. Miller, Christine Fox, Charles R. McComas, Claris Booth, Thomas H. Chapman, Harry H. Howard, Margaret Carr, William J. Mackenzie, Michael G. Lucanish.

First Region—Frank Tower, Everett E. Newman, Julius G. Petrison, Richard I. Stamberger, Adam J. Zientarski, Robert O. Donaldson, Anthony J. Massari, Jacob Wohl.

Second Region—Raymond E. Dickens, Charles Fountain, Phillip Jackson, Frank M. Linville, William M. Maner, Merle M. North, Carl Schanche, Leonard A. Winkler.

Third Region—Guy L. Amyot, Harold J. Burhop, William H. Cramer, Clyde A. Hill, Paul T. McAvoy, C. R. Parker, Harold L. McTiche, Ray P. Morris, Ethel H. Ramaker, Archie W. Soeth, Walter N. Stoneman, Roy J. Thompson.

Fourth Region—Virgil G. Hawk.

Fifth Region—Henry Simmons, Wilbert Behn, Garland B. Ashlock, Percy E. White, Irving J. Rovang, John M. O'Connor, Henry G. Klein, Willard Gillette, Henry Gladney, Irving D. Marshall.

Sixth Region—Stanhope S. Boggs, Herbert Hela, Claude M. Smith, Elmer C. Butler, Dante H. Cordano, Francis A. O'Leary, Art Johnson, Otto F. Harlow, George W. Hammond.

Seventh Region—E. Z. Simonds, R. Montle.

Eighth Region—Chris Lample.

Ninth Region—William E. Kline, Theodore K. Johnson, Daniel L. Givens, Samuel P. Kelly.

Washington National Airport—Lillie A. Nielsen.

Technical Development Center—O. J. Starr.

One present employee of the Civil Aeronautics Board, Jesse W. Lankford, Chief of the Accident Analysis Division, started with the Aeronautics Branch in 1927.

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CAA JOURNAL

DEPARTMENT OF COMMERCE
Charles Sawyer, *Secretary*

Civil Aeronautics Administration
Charles F. Horne, *Administrator*

Ben Stern, *Director*
Office of Aviation Information

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In the Service of CAA Since Its Earliest Days

A few of the nearly 100 employees of the CAA and the CAB who have been with the Federal civil aviation organization since its beginning 25 years ago. From left to right: Charles McComas, Julia C. Hevener, Jesse W. Lankford (CAB), Christine Fox, James L. Kinney, Claris Booth, Stafford Kernan, Katherine M. Miller, A. J. LaBaie, Margaret E. Carr and George M. Bailey.

National Defense and Aviation Boom Gave Impetus to Airport Advances

Twenty-five years of progress in any line of endeavor can be tremendous, but in aviation it has been nothing short of spectacular. This is true of all phases of the aviation industry, but especially in the number, design and operating efficiency of the Nation's airports.

Our modern airport facilities are taken pretty much for granted by the average American. It seems like they always have been here. Few realize the difficulties over the past 25 years in keeping the airports of the country abreast of the number and technical advances of operating aircraft. In fact, on several occasions during this period it appeared that airport development had been completely out-stripped by the aircraft phase of the industry.

The Government, through the Civil Aeronautics Administration and its predecessor organizations, has been active and keenly interested in the development of an adequate system of airports for the country since May 20, 1926, when the Air Commerce Act of 1926 vested in the Secretary of Commerce the responsibility of promoting air commerce through "the establishment of airports, civil airways and other air navigation facilities."

Lighted Fields Provided.—Old records failed to produce any statistics on the number of airports back in 1926 except for 92 lighted CAA intermediate fields. It was the policy in those days to put lighted intermediate fields spaced 20 or 30 miles apart along the air routes between major cities. For example, in December, 1926, it was proposed to put intermediate fields at Teterboro, New Jersey; Bethany, Connecticut; and Dudley and Framingham, Massachusetts on the New York-Boston airway.

Old records for the year 1927 showed a total of 1,036 airports in operation across the country. These included 263 commercial fields, 240 municipal airports, 134 CAA intermediate lighted fields and 320 auxiliary fields. There were an additional 79 airports in other categories, including military and private.

A comparison of the airport figures for 1951 with those of 1927 reveals the tremendous growth in these facilities. The April, 1951 total of airports was 6,388, which included 2,278 commercial; 2,288 municipal, 75 CAA intermediate, 335 military and 1,252 in other categories. The 1951 figure shows a total of 1,163 paved airports, and while no statistics are available on the number of paved fields 25 years ago, there were undoubtedly only a very limited number. The vast difference between the 1927 and 1951 statistics does not, however, tell the complete story. During the 24-year span, hundreds of airports opened and closed during the depression years and again during World War II, when all but military and commercial flying was virtually abandoned.

The processes by which our airports grew in number are interesting and varied. Many airports were constructed by municipalities with their own money and now stand as shining examples of the farsightedness by city officials who had confidence in the new type of transportation that had sprung up almost overnight. Other airports were built by individuals for personal use. Many more, such as the CAA intermediate fields, were built by the Government for public use. Still others were constructed by the Government for emergency needs, and finally, Federal financial participation with units of local government accounted for a great number.

Large Scale Activity in 1933.—While the Air Commerce Act of 1926 instructed the Secretary of Commerce to encourage the development of airports, it was not until 1933 and after that the Government entered into the construction picture on any large scale except for the intermediate field programs.

From the early days of the Bureau of Air Commerce, through the WPA programs of airport construction and until 1940, the CAA, through an Airport Section in the Technical Development Division, had confined itself to giving advice and counsel on airport matters.

The Civil Aeronautics Act of 1938 directed the CAA to make a study of the airports of the Nation and to come up with recommendations for construction and development projects. The survey brought forth some startling facts. It showed serious deficiencies in the number and caliber of our airports. For example, although war clouds were on the horizon, this country did not have a single airport capable of safely handling all types of military aircraft.

Shortly after the outbreak of World War II in Europe in 1939, action was taken to increase the number of airports as well as to improve many existing fields. The CAA was given authority to request funds for the purpose of bringing the national system of airports up to the requirements of the Army and Navy.

This was known as the Defense Landing Area Program (DLA) which, with the Development of Civil Landing Area Program (DCLA), was administered by the CAA at an approximate cost of $395,472,835 during the early 1940's.

Airport Division Set Up.—It was at this time that the Airport Section was removed from the Technical Development Division of the CAA and set up as the Airport Division with responsibility for carrying out the DLA and DCLA programs.

Actual construction under the DLA program was done mostly through private contractors. The responsibility of supervision was vested in three other Government agencies in addition to CAA. They were the Army Corps of Engineers, the Works Progress Administration and the Navy Bureau of Yards and Docks. Construction supervision was divided among the four agencies within the continental limits of the country as well as in Alaska, the South Pacific area, Puerto Rico and Panama.

The DLA was responsible for a total of 508 airports in the United States, bringing our airport system up to required strength. In addition, 29 airports were constructed outside the country, 14 in Alaska, 8 in Hawaii, 2 in the South Pacific, and 1 each at Canton Island, Palmyra Island, the Panama Canal, Puerto Rico and Samoa.

The DCLA program was initiated in fiscal years 1943-44 to complete the work started under the WPA and discontinued when that agency was deactivated.

A total of $9,718,719 was appropriated for DCLA work. In all, DCLA airports were constructed at 30 locations, all within the limits of the country.

With the end of the war, the airport construction programs leveled off, but the DLA and the DCLA had accomplished the job for which they were intended and eliminated many of the deficiencies in the defense airport system.

New problems were not long in arising, however, in the post-war years.

Many Small Airports Closed.—The war-time programs had solved one problem but another had remained unsolved. The gains made by the DLA and DCLA were offset to a degree by the fact that hundreds of small airports had closed down during the war because of the ban on flying and had not reopened. To add to the problem, personal flying was increasing by leaps and bounds under the impetus of the GI Bill. In addition, the post-war period showed promise of a tremendous increase on airline traffic.

In spite of all the construction in the early '40's, it was obvious that the airports at the time would not be sufficient to meet the growing needs of air transportation over the years and that unless something was done, the rapid advances in aviation would again outrun the developments made in the field of airports. As a result, almost 20 years to the day after the passage of the Air Commerce Act, the congress enacted the Federal Airport Act on May 13, 1946. It authorized the expenditure of $500,000,000 in Federal funds for the construction and development of airports over a 7-year-period.

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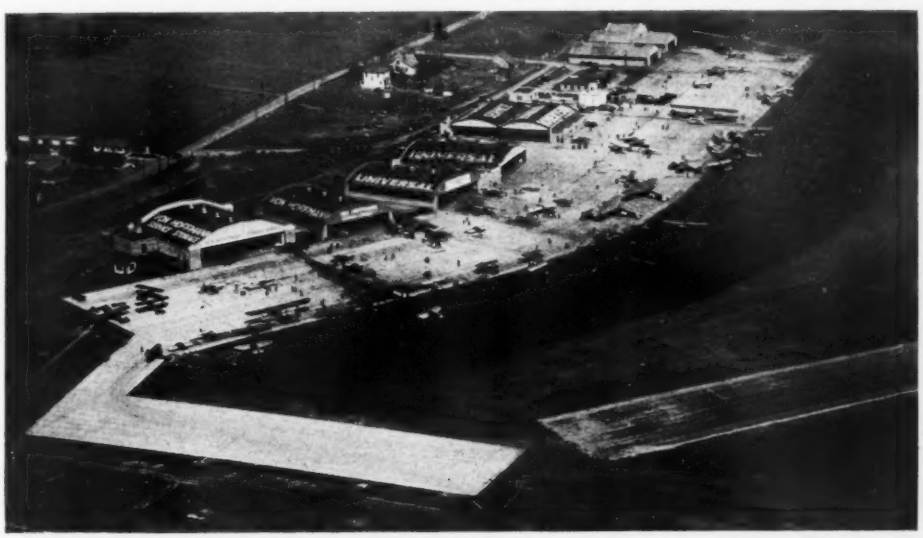
Forerunner of Modern Metropolitan Airports



Lambert Field at St. Louis shown above as it appeared many years ago, was one of the nation's largest airports when airport operation was on the way to becoming big business.

"Get the Facts and Build Upon Them" Basis of CAA's Technical Development

Few arts have produced so many new ideas in so short a time as that of air transportation. Conquest of the air is a dramatic challenge, and this results in a continuous reaching forward for new means of flying. The strangeness of flying has kept man constantly conscious of the need for improving safety.

This search for something new and for greater safety underlies the CAA's research, development, and evaluation activities. The CAA has a policy of first finding out the facts and then building upon them. This policy has paid off in so many concrete improvements that space here will not permit of anything more than a mere tabulation of results.

The Technical Development and Evaluation Center at Indianapolis is the site for most of the CAA's development work. Its activities differ from research in that engineers there take inventions and discoveries and develop them to the point where they can be applied practically to air transportation. Inevitably, invention occurs during this work, and the airways today are examples of much more than the development of known ideas.

At TD, which is the familiar tag for the Center, the work now is divided into three main groupings—aircraft and appliances, airport pavement and lighting, and radio aids to navigation. Within this framework, an amazing number of contributions to flying have been made. They range from a new and better hand tool for testing the strength of a plane's covering to the complete new system of navigation aids now being installed on 70,000 miles of federal airways.

Cooperative Efforts.—A profitable association has existed from the beginning between the CAA, the aviation industry, and the other government departments which are concerned with flying. Many a major advance in radio aids, in the increased safety of aircraft structure, or in the safety of aircraft fuel, has come from the personal association of CAA engineers with men from the industry, engineers from the Army and Navy, or with inventors who had something to offer in the development of air transportation. Many aeronautical items now in general use originated from development work at Indianapolis, where government brought them to usefulness and then turned them over to the industry to manufacture and sell. The flying public has been the beneficiary of such cooperation.

In recent years, TD has produced this record of major accomplishments:

Aircraft and Appliances

A "sandwich" type windshield, consisting of glass and plastic, strong enough to withstand collision with birds in flight, now being built into our transport planes.

A simple device to warn pilots of the approach of a stall, to eliminate the worst cause of flying accidents.

Fire-resistant coatings for airplane fabric.

Means for discovering and extinguishing airplane powerplant fires in flight.

Flashing aircraft navigation lights for better plane recognition.

Safer exhaust manifolds, and vacuum pump systems.

Fire-proof oil tanks.

A simple and improved method of extinguishing fires in airplane wheels and brake systems.

A simpler and more positive test for detecting deteriorated airplane fabric.

A flamability scale for use by the industry in fire studies.

Better means of discovering and controlling fires in airplane baggage compartments.

Currently, engineers at TD are continuing their studies of fires in airplane powerplants, both conventional and jet; they are seeking a fuel and oil tank which will not rupture and produce fires after crashes; and they are collaborating in many studies such as standardization of controls in large aircraft.

Radio Aids to Navigation

Continuous development and improvement of the Instrument Landing System, developed originally by the Bureau of Standards and now in use throughout the Federal Airways system, including recent antenna developments which insure the accuracy of the glide path signals on snow-covered fields.

Development of the very high frequency omnidirectional range from an idea mentioned by an industry engineer to its present adaptation to the entire airway system.

Practical completion of workable automatic instrument landing system.

Development of less expensive, very high frequency airborne equipment to enable private owners to use the new and improved airway aids.

Development of distance measuring equipment as an element of the new VHF system of navigation.

In-service improvement of the war-born radar landing aid.

Some of TD's major projects now involve better air navigation aids, such as the study of new types of instruments which give the pilot pictorial representations instead of symbolic and thus make flying easier and safer; a radar screen that can be used in daylight; and development of a course-line computer for use by airline planes on the VHF airways.

Airport Paving and Lighting

Slope line approach lights to give the pilot direction altitude and attitude information in the final moments of landing.

A transmissometer to give continuous, accurate reading of visibility at airports.

Means for accurate measurement of airport pavement strength.

Means for continuous reading of moisture content of subpavement soil at airports.

Various methods of stabilizing soil for inexpensive "paving" of landing strips.

A study of the soil of the entire country through the use of aerial photographs for facilitating airport location studies.

This division has produced a special light laboratory for use by government and industry which will greatly improve its studies in the use of light for

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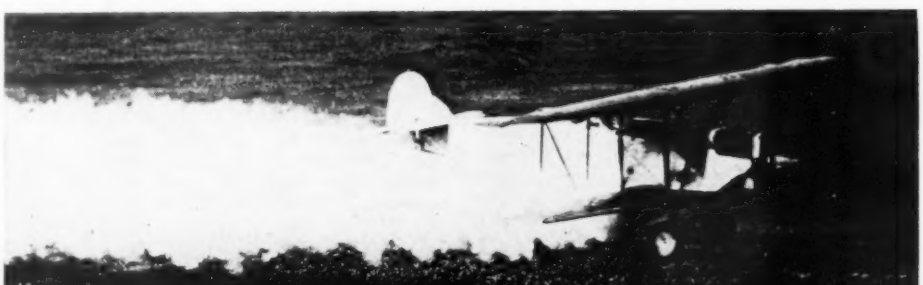
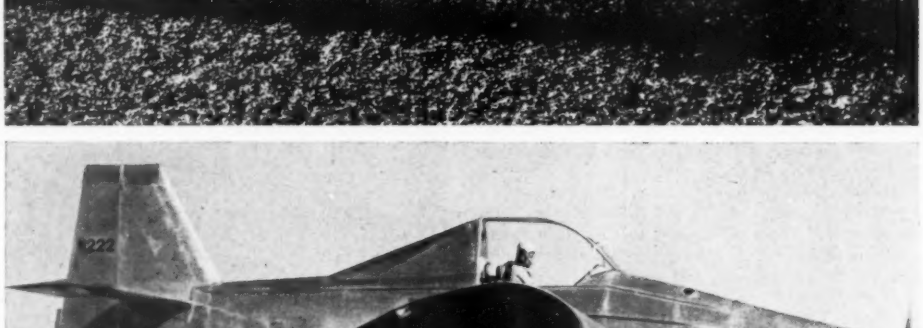
The Old and the New in Crop Dusting Operations





The upper photograph shows the old "duster"—an open cockpit job that dusted both the pilot and the crops. The plane in the lower picture is the CAA prototype, now being field tested. It embodies most of the features of the "perfect" duster and can be used for dusting, spraying, seeding and fertilizing.

Daredevil Pilots Went Out of Business With Development of Aviation Safety

Back in 1926, civil aviation in the United States definitely was suffering from "growing pains." No license was needed to fly and there was no one to tell the overzealous pilot that his plane was not fit to fly. If a man wanted to risk his neck—well, it was his neck.

It was an era of stunt flying and air races, with surplus World War I planes taking off from cornfields and cow pastures to haul passengers at county fairs and Fourth of July celebrations.

These pilots had awakened a great interest in flying. It was apparent that the airplane had a great future if someone could put a check rein on the daredevils who were giving aviation a black eye.

But there were signs that aviation was coming of age. Barnstormers who had thrilled thousands of spectators at air shows and county fairs were settling down at established airports to establish flying schools and flying services. Pilots tired of flying war surplus planes were beginning to build new models. There was the bright prospect of air mail contracts, following the Morrow Board report of 1925.

Far-sighted aviation enthusiasts had been trying for a long time to curb the flyers who were more interested in stunts and thrills than in promoting safety. But the influence of these level-headed men who understood the real future of aviation was confined to limited areas.

Aeronautics Branch Established.—This group, convinced of the future of aviation and determined to follow that industry as a livelihood, was responsible for the Air Commerce Act, signed by President Coolidge on May 20, 1926, which resulted in the establishment of the Aeronautics Branch of the Department of Commerce. Under this Act, the Secretary of Commerce was given an assistant secretary to be in direct charge of the Branch. Regulation was to include such things as certification of aircraft as to airworthiness, periodic examination and rating of airmen, examination and rating of air navigation facilities, and establishment of air traffic rules.

But setting up an organization to regulate such a far-flung and varied industry was no easy task. The Aeronautics Branch moved cautiously. One of the first activities of the Branch was to license pilots and airplanes and to establish standards of safety in the design, construction, and operation of aircraft.

Early in 1927 there were only 13 inspectors to handle certification of pilots, aircraft and operations. Pilots continued to fly without formal licenses. A person who wanted to pilot a plane wrote the Aeronautics Branch. He was issued a letter of authority to fly until the overworked inspector could find time to give him an examination.

Today the Office of Aviation Safety operates with some 1,750 employees, of whom almost 800 are safety agents, available throughout the country in 138 district offices.

Statistics Show Growth.—The spectacular growth of aviation is vividly shown by a few statistics. In 1926, airline passengers totaled 5,782. In 1935, the total was 860,761. In 1946, scheduled, domestic and territorial lines carried 12,238,629 revenue passengers. The international routes alone carried 1,041,127 revenue passengers in 1946.

In 1950, the scheduled domestic and territorial airlines carried 17,420,859 revenue passengers, while the scheduled international and overseas lines carried 1,676,540 revenue passengers.

As air routes were extended and the airlines grew, the carriers and the CAA were brought into closer partnership, working together with a common goal—the promotion of safety. The results have been significant. In 1930, the first year for which complete statistics are available, there were 28.2 passenger fatalities for each 100 million passenger miles of scheduled domestic airline flight. Safety figures have steadily improved since that time until in 1950 the nation's domestic scheduled airlines operated at the low fatality rate of 1.1 for every 100 million passenger-miles flown.

In 1938, the Air Commerce Act was amended by the Civil Aeronautics Act of 1938, which set up the Civil Aeronautics Authority and which made several important changes in provisions regarding safety regulations. By presidential order, the Authority in 1940 was separated into the Board and the CAA, with the Board given rule-making powers and the CAA, enforcement duties.

In carrying out the provisions of both the Air Commerce Act and the Civil Aeronautics Act, the CAA and its predecessor agencies have proceeded on the theory that the Government should work with the industry in promoting civil aviation and encouraging safety. Several definite steps to that end have been taken.

Industry Cooperation.—Industry sits in on rule-making procedures. Much of the inspection work is delegated to industry. CAA officials feel that the industry should certify to the airworthiness of many of its products; that the industry should "police" itself with a minimum of outside regulation; and that the Federal agency should progressively shift such responsibility to the industry.

Some 7,000 qualified and responsible individuals throughout the industry have been designated to serve as representatives of the CAA. Included are experienced airmen authorized to give pilot examinations and flight tests; doctors; aircraft and engine experts to give airworthiness inspections to planes in service; and factory inspectors and engineering representatives whose approval of factory products is accepted by CAA.

The CAA says to approved manufacturers of accessories: "You certify that your product meets the technical standards and we will accept your word for it." Now it is proposed that the manufacturers of light planes of less than 5,000 pounds and carrying not more than five persons be authorized to assume full responsibility for testing and certifying their own products.

In another field, that of airline operations, the close cooperation between the industry and the CAA has paid big dividends in promoting safety by means of the daily reports of mechanical difficulties which the carriers make to CAA agents. Carriers are required to report, within 24 hours, any mechanical difficulty of incident involving aircraft considered hazardous to air safety. These reports are sent immediately to Washington, where they are analyzed by the CAA and a summary provided for the whole industry.

Back of the reporting system is the idea that collecting and disseminating information on mechanical difficulties to the people who can minimize the recurrence of similar difficulties will eliminate many potential hazards in time to prevent trouble. The plan permits the CAA and the industry to pool and exchange information.

Accident Research Valuable.—Research into the causes of accidents also has contributed to safety. As a result of this research, the industry now knows

(Continued on page 66)

Aviation Know-How Introduced Abroad By CAA's Missions

Expanding American flag carrier world air service, bringing increased worldwide responsibilities to the United States, has resulted in the formation of an International Region in CAA which covers all of the world, excluding the United States and its territories.

Around the world the technical know-how of our aviation experts is being offered to friendly nations. On the island of Ceylon a CAA airport engineer performs a complete survey and guides the government in preparation of a landing field to welcome the aerial commerce of the world. In Bolivia, a CAA engineer assists in re-designing the highest commercial airport in the world. In Paris and Bangkok and Athens, CAA aviation experts work shoulder to shoulder with French, Siamese and Greek aviation experts, welding friendship by improving air communication.

Missions Abroad in 1927.—Beginnings of this international activity may be dated from the International Civil Aviation Convention in Chicago in 1944, even though the CAA had sent aviation missions to many countries in Central and South America as early as 1927. These missions were composed principally of technical men assigned to assist other governments in specific problems connected with airways and air safety. Such missions are still being dispatched to our friendly nations—eight missions were abroad in 1951—where they "sell" our style of federal regulation and give assistance to officials. An important result of their service is the extension of the area over which are our advanced type of airways aids and where the promotion and supervision of aviation activities for maximum safety are made standard practice. Formal efforts toward world standardization, however, began at the Chicago conference.

The world routes of our own airlines and of foreign airlines required the establishment of CAA offices at various points about the world. Today, there are 10 such International Region offices, located at London, Paris, Cairo, Bangkok, Manila, Tokyo, Rio de Janeiro, Lima, Buenos Aires, and Balboa. A staff, usually consisting of an airway man and a safety man, comprise these offices, and they are there to give service to other nation's airlines which fly into this country, as well as to our own airlines. These agents also give examinations to airmen for U.S. certificates and authorize repair stations to perform work on carriers flying into this country.

Foreign Experts Trained in U.S.—Today, the Washington headquarters of the International Region office is the focal point for aviation officials from every country in the world where air transportation is being advanced. Experts of scores of countries have visited and inspected our facilities. Other scores have been brought to this country for training by the CAA, using funds provided for the purpose by the State Department, and lately, from the Point Four program. This job of indoctrination is one of the important duties of International Region officials.

Larger groups are trained in the CAA's Aeronautical Training Center at Oklahoma City under the direction of the International Region. These are the foreign nationals who will go back to their countries and install the government organization required for the aviation interests of their nations. In most cases, these new organizations reflect directly the influence of the training received here. Civil air regulations in a dozen South American countries are almost verbatim translations of our air commerce regulations. It has followed that the U. S. designs in airway aids appear on the airways all over the Western Hemisphere.

Today's Invisible Highways in the Air Grew from Line of Gas-Lit Beacons

Federal airways, as such, were almost non-existent in 1926. Aids to air navigation consisted almost exclusively of electric and gas beacon lights, plus a handful of emergency intermediate landing fields.

The fact that weather information could be transmitted by radio to a pilot in flight was well known in 1926, and crude radio direction finders were in occasional use. But in general, the contributions which electronics were to bring to aviation over the next 25 years were scarcely dreamed of.

The concept of airways as free highways for the transportation of man and his goods, however, was well established 25 years ago. It was clearly recognized that well-equipped aerial highways were important national economic assets, and that improvement and maintenance of these airways was essentially a responsibility of the Federal Government.

Over the years from 1926 to 1951, the growth of the federal airways system has kept pace with the rapid expansion of civil and military aviation. The pilot of 1926, transported to 1951, would recognize the beacons which still burn along much airway mileage. But everything else about the airways would be very strange indeed to him.

Today's airways, although invisible, are charted as accurately as any railroad line or super-highway on the ground. When bad weather closes in, all man-made things which fly, from small personal planes to super-airliners, move along these aerial highways to their destinations.

Airways Connect Cities.—Today, there are some 70,000 miles of federal airways in North America, serving more than 100,000 civil and military aircraft. There are main trunk east-west and north-south airways connecting the great metropolitan cities, and running from coast to coast and border to border. Supplementing these major airways is a network of feeder airways, corresponding to the secondary highway system on the ground. Operation and maintenance of these airways is an important part of the work of the CAA.

Traffic along the airways, like traffic on the ground, follows the rule of "keep to the right." But the aerial highways are quite different, in most respects, from their counterparts on the ground. Airways, for example, are uniformly 10 miles wide. And each airway is really a multiple "highway" system, with separate "highways" one above another, at 1000-foot altitudes, all the way up to 20,000 feet or more.

During clear weather, when pilots can sight other aircraft at distances of several miles, flying is not confined to the airways. A pilot can, if he chooses, make off-airway flights, depending on his own vision to prevent collisions and other hazards, and relying on ground landmarks to maintain his course. However, as a matter of convenience, much aerial traffic remains on the airways even in the best of weather conditions.

Bad Weather Highways.—When clouds and rain and fog obscure the skies, the traffic picture changes. Obviously, it would be unsafe to have thousands of uncontrolled aircraft dashing blindly through the air at speeds of several hundred miles an hour. All flying under low-visibility conditions, therefore, is channeled along the invisible highways of the air.

Since these airways are invisible, an obvious question is, "How does the pilot know when he is on the airway, and how does he keep to the right, out of the path of approaching planes?" The answer lies in an extensive chain of ground radio ranges, first installed in 1928, which transmit radio courses along each airway. The pilot listening to his radio, hears a steady tone, together with a "dot-dash" or "dash-dot" signal, depending on which side of the airway he is flying. As long as he hears the background tone, together with the correct "dot-dash" combination, he knows he is on the airway and "keeping to the right" as he should.

An even better radio range system is now being installed along our airways, using ground equipment called an "omnirange." The Omnirange system permits pilots to fly by watching a vertical pointer, it is free from static, and gives highly accurate course information. Already in use by many pilots, the omnirange will be the standard airway range after 1954.

Controllers Direct Traffic.—While the radio ranges keep the airplanes on the airways, they solve only part of the traffic problem. The pilot, under instrument flight conditions, can see nothing ahead or behind him. Like the engineer of a railroad train under similar conditions, he must depend on traffic controllers to prevent his overtaking other aircraft, and to prevent other aircraft from colliding with his plane from behind, or at airway intersections.

The air traffic controllers—unknown in 1926—today operate in 30 centers and nearly 200 civil airport towers. By means of radio reports from the pilots, they keep careful track of every airplane flying during instrument weather; know its approximate position along each airway, and the time it probably will arrive at each check point. Their work is integrated with the military system.

Like a giant aerial checker game, the traffic controllers move aircraft up or down to different traffic levels, hold them at radio fixes, or speed them on their way as the situation requires. Each aircraft is separated from the next by a safe time interval, or by a 1000-foot altitude level.

This system has proved safe and effective over many years. But the traffic control system, like the radio ranges, is being modernized and improved. The need is urgent, since air traffic has increased very rapidly in recent years, and many of our airways are now saturated with traffic and in some cases unable to meet current demands.

Electronic Aids.—In the new traffic control system, war-born electronic miracles such as radar and perhaps some form of television will play a major part. Some equipment of this type already is in operation. By giving the pilot more accurate information about his exact position, and by providing the air traffic controller with information through the "eyes" of radar, aircraft soon will fly safely with less separation than is used today, and airways capacity will be increased.

Communications, obviously, are vital to successful operation of the traffic control system along our aerial highways. For most purposes, ordinary voice radio is the connecting link, with the air traffic controller talking directly to the pilot, or indirectly through scheduled airline radio facilities.

The radio ranges along the airways have voice transmitting facilities, so that pilots can hear regular weather broadcasts every 30 minutes, or receive special instructions from air traffic control. The CAA communication stations along the airways have receivers tuned to all the frequencies used by civil and military fliers, and stand guard constantly to receive and transmit information.

The CAA centers and towers are linked by a series of teletype networks, over which weather information and flight plans move in a steady stream. At some locations, private-line telephone equipment supplements the other communication links. The scheduled airlines maintain their own radio networks in addition.

VHF Radio Popular.—The communications trend today is to very high frequency radio, which is inherently static-free. More and more airlines and private fliers are using this part of the radio band, which is somewhat higher on the radio spectrum than television and FM broadcasts. While transmission in the very high frequency radio band is limited to about 100 miles in range, its static-free qualities make it more reliable and efficient than the lower frequencies.

Each airway, it was pointed out earlier, has a number of traffic levels separated by 1,000 feet of altitude. This vertical separation solves, in a large measure, the problem of en route traffic control. But at major terminals, where several airways may be feeding into a single large airport, it introduces a series of new problems.

Only one airplane can land at a time on a single runway, and approaching airplanes must be far enough apart so that if the first plane runs into difficulty on the runway, the one behind it can pull up safely. Furthermore, airplanes approaching from high traffic levels, such as 10 or 12 thousand feet, must be brought down safely through the other levels to a point where they can make an approach to the runway—usually from the 1,000-foot level.

All this sounds quite complicated. And it is, in fact, the most difficult part of air traffic control. Under normal procedures, incoming planes are held at radio fixes, or holding points, some distance from the airport, and at the altitudes of arrival. Here they circle while awaiting instructions. The system is safe enough, but clumsy and often wasteful of time. The situation is being rapidly improved, thanks to new electronic tools available to air traffic controllers.

Bad Weather Landings.—One of these is the Instrument Landing System, now installed at major air terminals throughout the United States. The ILS consists of radio transmitters on the ground which send out a radio beam, or "radio highway," down which an approaching airplane can fly to the runway. The pilot, watching instruments in the cockpit, can fly down this radio beam to a perfect landing, even when the ceiling is only 200 feet, and visibility one-quarter mile. The ILS system greatly reduces the number of missed approaches to the runway, and in turn cuts down on the number of irregularities in the traffic pattern.

Radar is another air traffic control tool of great value. The radar equipment now in use at several airports, and being installed at more congested airports throughout the country, is of two types, surveillance and precision approach.

Surveillance radar provides the traffic controller with a "picture" of all aircraft within a radius of about 30 miles. The information appears on the face of an electronic tube, similar to that used in television receivers. The center of the tube face corresponds to the location of the airport, and concentric circles on the face represent distances in miles from the airport.

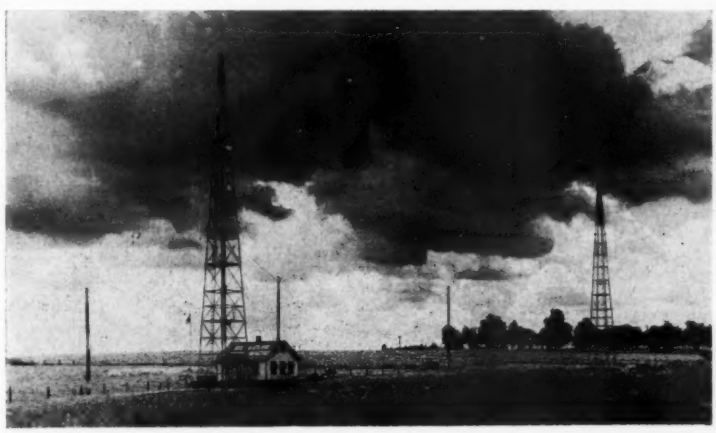
Aircraft appear on the tube face as tiny spots of light, or "pips." By studying the pips, the traffic controller can tell the direction, distance and course of all planes in his area.

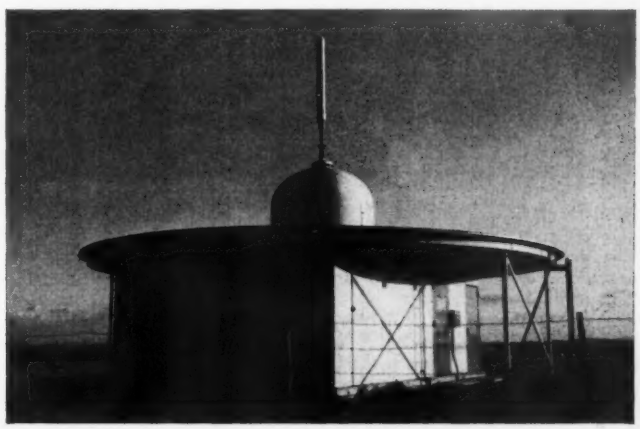
Radar Used for Landings.—Precision approach radar is used in a different way. The face of the tube, instead of showing the whole area around the airport, covers a narrow strip of space extending a few miles out from the runway in the direction from which aircraft approach for bad-weather landings. The pips which appear on the precision approach radar tube show very precisely—within a few feet—the altitude and the direction of an approaching plane. By watching the radar tube, and talking over ordinary voice radio to the pilot, the traffic

(Continued on page 68)

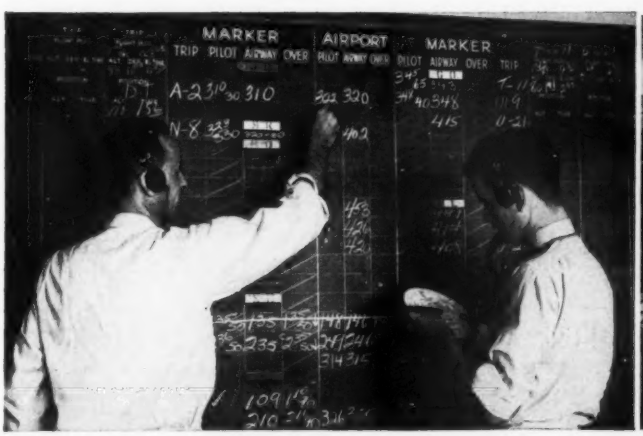
"Then and Now" Portrayal of Airway Developments

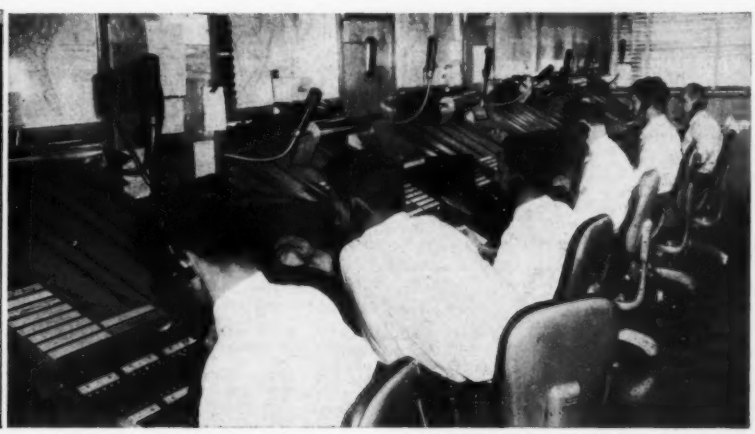
The experimental operation of one of the first air-ground radiotelephones is shown on the left. This was the forerunner of our present two-way system. The radio range chart on the wall shows the Boston-New York-Cleveland airway, extended to Sterling, Ill.—the complete system at that time. On the right, a controller is using the new precision beam radar scope in combination with air-ground communication to "talk" a pilot down to a landing. This scope is also used to monitor landings on the ILS system.





On the left is pictured one of the early four-course radio range stations. An improved version of this type station may be seen today on most of our airways. Very-high-frequency omnirange structures like the one shown on the right eventually will replace the lower-frequency ranges now in use. Recently installed on the New York-Chicago airway, they will begin operating on an experimental basis in Ju!y.





One of the early flight-progress boards used in the traffic control center to keep track of planes on the airways is portrayed on the left. The location of the aircraft was entirely dependent on the report of the pilot. The new version, an experimental installation at Washington, is shown on the right. While more complicated, it is much more efficient. Using long-range radar, the controller can "see" the position of the plane. He can even give the pilot the position of the aircraft more accurately than the pilot himself can determine it visually.

Official Actions . . . . . Civil Aeronautics Board

Regulations

Amdt. 3-5.....**Effective April 30, 1951**

Amends Part 3 to clarify existing stall requirements.

Amdt. 20-11.....**Effective April 30, 1951**

Amends Part 20 by adding a new § 20.58 requiring an identification card for pilots after September 1, 1951.

Amdt. 20-12.....**Effective August 1, 1951**

Amends Part 20 with respect to the knowledge, experience, and skill requirements for private pilot ratings.

The following explanation is taken from the Board's statement issued in connection with the amendment:

A study of accidents in 1948 and 1949 involving private pilots, which was recently conducted by the CAA, indicates the need for revision in our standards of aeronautical knowledge, experience and skill for applicants for a private pilot rating. Pilot error was shown to be the principal or contributing cause of most of these accidents, owing, in the main, to the possession of insufficient information, instruction, or experience.

A number of the changes are intended to require applicants for a private pilot rating to: (1) pass a more comprehensive written exam, including questions on regulations affecting the safe operation of aircraft, and (2) gain special instruction and experience in dealing with the problems attendant upon cross-country flight. It is believed that, consistent with the best interests of safety, these amendments will serve to reduce the number of accidents caused in whole or in part by pilot error by raising the required level* of competence among private pilots.

In addition, certain of the changes are intended to revise, as far as possible, our standards of aeronautical knowledge, experience, and skill for applicants for private glider pilot ratings, so that they shall be consistent with international standards established under Amendment 65 of Annex 1 to the Convention on International Civil Aviation. The principal changes concern an increase in the age minimum from 14 to 16 years and the inclusion, in the knowledge requirements, of meteorology, theory of flight, and glider operating limitations.

Amdt. 22-5.....**Effective April 30, 1951**

Amends Part 22 by adding a new § 22.32(g) requiring an identification card for lighter-than-air pilots after September 1, 1951.

Amdt. 22-6.....**Effective August 1, 1951**

Amends Part 22 to conform to international standards by reducing the age minimum of an applicant for a free balloon pilot certificate from 18 to 17 years and changing the experience requirements.

Amdt. 24-4.....**Effective April 30, 1951**

Amends Part 24 by adding a new § 24.47 requiring an identification card for mechanics after September 1, 1951.

Amdt. 25-1.....**Effective April 30, 1951**

Amends Part 25 by adding a new § 25.86 requiring an identification card for parachute riggers after September 1, 1951.

Amdt. 26-4.....**Effective April 30, 1951**

Amends Part 26 by adding a new § 26.37 requiring an identification card for tower operators after September 1, 1951.

Amdt. 43-6.....**Effective August 1, 1951**

Amends General Operations Rules relating to requirements for first solo, flight area limitations and recent flight experience.

Amdt. 50-3.....**Effective August 1, 1951**

Eliminates the current flight time requirements in respect to spinnable and nonspinnable airplanes and, instead, provides for a minimum of 35 hours of flight time applicable to training in all airplanes.

Amdt. 51-4.....**Effective April 30, 1951**

Amends Part 51 by adding a new § 51.6 requiring an identification card for ground instructors after September 1, 1951.

SR-362.....**Effective April 27, 1951**

Authorizes Reeve Aleutian Airways, Inc., to schedule a pilot to fly, without a rest period in the course of flight, 8 hours and 30 minutes or less during any 24 consecutive hours between Anchorage and Adak, Alaska. Terminates April 1, 1951.

ER-162.....**Effective May 4, 1951**

Amendment No. 3 to Part 291 changes from May 6, 1951, to June 5, 1951, the effective date of the regulations concerning operational limitations on exercise of temporary exemption by large irregular carriers.

PR-11.....**Effective May 10, 1951**

Amends Part 302 by adding a new § 302.20 fixing a procedure whereby certificated air carriers may file with the Board petitions to conduct charter trips or special services into areas protected by § 207.8 of the Economic Regulations.

Safety Orders

S-406 opinion and order revoke the nonscheduled air carrier operating certificate No. 1-605 of Regina Cargo Airlines (April 12).

S-407 affirms examiner's order and orders that the period of suspension of the airman certificate of Muriel L. Woosley shall commence on April 30, 1951 (April 20).

S-408 affirms findings of examiner and modifies his order so as to suspend the airman certificate with private pilot, single-engine land ratings of George V. Clow for 90 days commencing on May 6, 1951 (April 26).

S-409 terminates proceeding in the matter of a complaint of the Administrator of Civil Aeronautics against J. R. Richardson (May 2).

S-410 terminates proceeding in the matter of a complaint of the Administrator of Civil Aeronautics against J. W. Kiewel (May 4).

S-411 grants request of Air Tours, Inc., for waiver of § 42.55(a) of the Civil Air Regulations until May 1, 1952, with stated provisions (May 7).

S-412 vacates initial decision of the examiner and remands the proceedings to the examiner for further hearing in the matter of a complaint of the Administrator against John M. Anderson (May 11).

S-413 modifies examiner's order so as to suspend the pilot certificate of Robert C. Stroop for a period of 5 days to commence on May 21, 1951 (May 11).

S-414 suspends airman certificate of Theodore T. Eagan for 60 days to commence on May 21, 1951 (May 11).

Airline Orders

E-5202 grants Currey Air Transport Limited exemption for 2 years subject to stated terms, conditions, and limitations, from the provisions of section 401 (a), 404 (a), and 405 (e) of the Act so as to permit it to engage in certain irregular air transportation; terminates temporary exemption granted by Part 291; otherwise denies (March 16).

E-5203 grants Conner Air Lines exemption for 2 years, subject to stated terms, conditions, and limitations, from the provisions of section 401 (a), 404 (a), and 405 (e) of the Act so as to permit it to engage in certain irregular air transportation; terminates temporary exemption granted by Part 291; otherwise denies (March 16).

E-5204 denies petitions of Pan American World Airways, Caribbean Atlantic Airlines, Capital Airlines, Trans-Caribbean Air Cargo Lines, and Riddle Aviation Company for reconsideration of the Board's decision in the *Additional Service to Puerto Rico* case (March 16).

E-5205 opinion and order terminate proceedings in the National Route Investigation instituted by orders serial Nos. E-2025 and E-3110 and close Docket 3500 *et al.* and institute show cause proceedings designated "The New York–Balboa Through Service Proceeding," Docket No. 4882; consolidate various applications into this new proceeding; except to the extent specifically granted, deny all motions or petitions filed in Docket 3500 *et al.* (March 16).

E-5206 denies petition of the City of Omaha, Omaha Chamber of Commerce, and the Chamber of Commerce of Council Bluffs, Iowa, in the *Additional Service to Kansas* case (March 19).

E-5207 approves Agreement C.A.B. No. 4538 *et al.* between Eastern Air Lines, Valencia Service Company and various other carriers relating to intercompany arrangements (March 19).

E-5208 approves Agreement C.A.B. No. 819-A3 *et al.* between Western Air Lines, Empire Air Lines, and various other carriers relating to intercompany arrangements (March 19).

E-5209 approves Agreement C.A.B. No. 4449 *et al.* between United Air Lines, Mr. P. K. Findeisen, d/b/a Hawaiian Hauling Service, and various other carriers relating to intercompany arrangements (March 19).

E-5210 approves Agreement C.A.B. No. 4709 *et al.* between National Airlines, Aerovias Cubanas Internacionales, S. A., and various other carriers relating to intercompany arrangements (March 19).

E-5211 dismisses applications of Continental Air Lines for certificates (March 19).

E-5212 dismisses applications of Chicago and Southern Air Lines for certificates (March 19).

E-5213 approves Agreement C.A.B. No. 4127-A *et al.* between United Air Lines, Jack E. Searles, d/b/a Mascot Enterprises, and various other carriers relating to intercompany arrangements (March 19).

E-5214 authorizes Pan American World Airways to suspend service at Noumea, New Caledonia, on route FAM 14 until such time as an airport there is adequate for use with Boeing B-377 aircraft (March 19).

E-5215 approves Agreement C.A.B. No. 4928 *et al.* between Braniff Airways, Central Airlines, and various other carriers relating to intercompany arrangements (March 19).

E-5216 dismisses complaint of American Airlines with respect to eastbound directional rates proposed by Slick Airways and the Flying Tiger Line (March 19).

E-5217 approves Agreement C.A.B. No. 4874 *et al.* between Trans World Airlines, Robinson Airlines Corporation and various other carriers relating to intercompany arrangements (March 19).

E-5218 approves Agreement C.A.B. No. 5006 *et al.* between National Airlines, Taca International Airlines, S. A., and various other carriers relating to intercompany arrangements (March 19).

E-5219 extends from March 25, 1951, through June 22, 1951, the period of suspension instituted by order serial No. E-4927, in the matter of the fares, rules and regulations for the air transportation of passengers proposed by National Airlines (March 20).

E-5220 amends order serial No. E-3781 in the matter of the temporary mail rates for Cordova Air Service over its routes certificated for the transportation of mail (March 20).

E-5221 withholds from public disclosure until final schedules are filed, or until March 31, 1951, the information and data in the preliminary reports on Schedules A and B of C.A.B. Form 41 for the 4th quarter of 1950, furnished by 7 air carriers (March 20).

E-5222 extends from April 14, 1951, to July 12, 1951, the period of suspension instituted by order serial No. E-4996 in the matter of the fares, rules and regulations for the air transportation of passengers proposed by Eastern Air Lines (March 20).

E-5223 grants Frontier Airlines exemption, until the date of the final decision by the Board in the Frontier Certificate Renewal Proceeding, from the provisions of section 401 (a) of the Act and its certificates, insofar as they would prevent it from originating and/or terminating flights at points short of the terminal points on routes Nos. 73 and 74 (March 21).

E-5224 denies motion of Pan American-Grace Airways and request of Pan American World Airways for consolidation of applications for amendment of certificates with the application of Lineas Aereas Nacionales, S. A., for a foreign air carrier permit under section 402 of the Act (March 23).

E-5225 dismisses petition of Capital Airlines insofar as it requests an early hearing on its application in Docket 2259 and an exemption to provide through flights between Milwaukee and New York-Newark; otherwise denies Capital's petition; grants United Air Lines leave to intervene (March 21).

E-5226 grants Pan American World Airways exemption from the provisions of section 401 (a) of the Act, insofar as they would otherwise prevent one stop at Washington, D. C., on one flight from Rio de Janeiro to New York on or about March 22, 1951, to discharge members of the Brazilian delegation to the Inter-American Conference of Foreign Ministers; otherwise denies (March 21).

E-5227 denies petition of Eastern Air Lines for reconsideration of opinion and order serial No. E-5084 in the matter of the investigation of Eastern's Air Coach Fare between Miami and San Juan (March 22).

E-5228 institutes investigation, suspends and defers use from March 26, 1951, to June 23, 1951, of certain round-trip air tour fares, and the rules and regulations relating thereto, proposed by Delta Air Lines (March 22).

E-5229 reopens proceeding and assigns further hearing on the seniority question in the matter of the *North Atlantic Route Transfer* case (March 22).

E-5230 orders Caribbean-Atlantic Airlines to show cause why the Board should not revoke order serial No. E-3592 and make final the findings and conclusions set forth in an attached statement thereby fixing the mail rates for Caribbean-Atlantic over its entire system on and after February 23, 1949 (March 22).

E-5231 amends paragraph 2 of the directory portion of order serial No. E-5090 in the *Southern Service to the West* case; except to the extent granted by this action, all of the petitions for rehearing, reargument and/or reconsideration of the Board's decision are denied (March 22).

E-5232 dismisses applications of Mid-Continent Airlines for a certificate and amendment of a certificate (March 26).

E-5233 fixes certain temporary mail rates for Robert Dale Byers and Gladys Byers d/b/a Byers Airways (formerly Edward A. Brennan d/b/a Lon Brennan Air Service) over its routes certificated for the transportation of mail; rescinds order serial No. E-5031 (March 26).

E-5234 grants exemption, from May 1, 1951, to October 1, 1951, to John C. Van Arsdale d/b/a Cape Cod Flying Service, from provisions of section 401 (a) of the Act and Part 291, insofar as such provisions would otherwise prevent it from engaging in air transportation of persons and property between Boston and Provincetown, Mass., without regard to frequency and regularity of service, subject to stated conditions; otherwise denies (March 26).

E-5235 denies Central Air Transport exemption which would permit it to engage in certain air transportation as authorized by Part 291; terminates temporary exemption, effective April 25, 1951 (March 26).

E-5236 denies Arrow Airways exemption which would permit it to engage in certain air transportation as authorized by Part 291; denies requests of various air carriers (March 26).

E-5237 denies petition of Missouri Airways for reconsideration and hearing of the denial of its application for exemption by order serial No. E-4755; terminates temporary exemption, effective April 25, 1951 (March 26).

E-5238 permits Riddle Aviation Company to inaugurate service on or after March 25, 1951, at Miami, Fla., New York, N. Y., Mayaguez, Ponce, and San Juan, Puerto Rico, through use of Miami International Airport, Newark Municipal Airport, Mayaguez, Santa Isabel, and Isla Grande airports (March 27).

E-5239 amends paragraph 2 of the directory portion of order serial No. E-4961, with stated provision, extending the exemption of Capital Airlines from the provisions of section 401 (a) and its amended certificate for route No. 14, until such time as two C-54's are returned from the airlift, or Capital acquires similar aircraft which may be used for its certificated all-cargo operations, whichever occurs first (March 27).

E-5240 denies petition of Cook Cleland Catalina Airways for reconsideration and reversal of the Board's order serial No. E-4955 which denied exemption under Part 291; revokes temporary exemption, effective April 27, 1951 (March 28).

E-5241 dismisses supplemental complaint of Chicago and Southern Air Lines requesting investigation and suspension of fares between Memphis, Tenn., and Paducah, Ky., proposed by Ozark Airlines (March 28).

E-5242 denies application of Oxnard Sky Freight for an exemption under Part 291 of the Board's Economic Regulations and section 416 (b) of the Act (March 28).

E-5243 orders Northwest Airlines to show cause why the Board should not fix certain temporary mail rates for mail transported on and after December 8, 1947, over its routes within the continental United States and between the United States and terminal points in Canada (March 28).

E-5244 orders Northwest Airlines to show cause why the Board should not fix certain temporary mail rates for mail transported on and after September 26, 1946, in its trans-Pacific operations (March 28).

E-5245 denies petition of Associated Airways for reconsideration of order serial No. E-4625 and hearing in the matter of its application for exemption under Part 291; revokes temporary suspension, effective April 28, 1951 (March 29).

E-5246 authorizes Southern Airways to omit service to Natchez, Miss., on segment 4 of route No. 98 on one northbound flight, with stated provision, until July 31, 1951, or such time as Adams County Airport is adequate for use by Southern during the hours of darkness (March 30).

E-5247 approves Agreement C.A.B. No. 5079 for the period ending June 30, 1952, between All American Airways and Twenty-Eight Other Air Carriers relating to a tender to military agencies of the United States for air transportation at a 10 percent discount, subject to a condition (March 29).

E-5248 opinion and order approve transfer of the certificate and the physical assets of Robert C. Reeve d/b/a Reeve Airways to Reeve Aleutian Airways, Inc. Approved by the President April 2, 1951 (Feb. 2).

E-5249 opinion and order deny application of Chicago and Southern Air Lines for an amendment of its certificate so as to add Chicago, Ill., as a coterminal point on its foreign route between New Orleans and Havana, and points in the Caribbean area and South America. Approved by the President (Feb. 8).

E-5250 approves loan to Rader Flying Service by First National Bank, Glenwood Springs, Colo., of $20,000 subject to a 70% deferred participation commitment by the RFC, with stated interest and payment conditions; issues certificate under section 4 (a) (1) of the RFC Act, as amended (April 2).

Suspensions and Revocations

Recent initial decisions by Civil Aeronautics Board examiners suspending or revoking certificates include the following:

Suspensions

Private pilot certificate of Henry K. Baker, Augusta, Georgia, suspended 6 months from January 31 for operating an aircraft in the vicinity of Waynesboro, Georgia, at an altitude so low as to sever some power lines.

Commercial pilot certificate of M. C. Collins, Tallahassee, Florida, suspended 6 months from February 3 for operating an aircraft after the hours of darkness when the aircraft did not display any position lights and for failing to have in his personal possession his pilot and medical certificates.

Commercial pilot certificate of John L. Nichols, Raleigh, North Carolina, suspended 4 months from January 22 and until such time as he passes a written examination on the Civil Air Regulations, for operating an aircraft during the hours of darkness without displaying position lights on the aircraft, and for low flying and performing acrobatic maneuvers within a civil airway in the vicinity of Raleigh.

Private pilot certificate of Donald G. Joyner, Raleigh, North Carolina, suspended 6 months from January 20 for low flying over the congested area of Raleigh.

Private pilot certificate of Lynne P. Meyers, Champaign, Illinois, suspended 6 months from January 18 for failing to conform to the traffic pattern established for the Gulfport Municipal Airport, Gulfport, Miss., and for failing to yield the right of way to another aircraft that was attempting to land on the airport.

Commercial pilot certificate of Leonard Zupancic, Joliet, Illinois, suspended 6 months from January 20 for low flying over the congested area of Joliet and for failing to have in his personal possession pilot and medical certificates.

Private pilot certificate of Howard C. Kruger, Portland, Oregon, suspended 30 days from January 18 for low flying in the vicinity of the Bonneville power crossing, about 10 miles from the Portland Airport. At the time of the violation, rescue operations were in progress following an accident at the power crossing and the aircraft was still suspended in the wires.

Commercial pilot certificate of William D. Orcutt, San Jose, Calif., suspended 60 days from January 23 for operating an aircraft in a careless manner in that he did not exercise proper vigilance while making a landing and for failing to have a valid medical certificate in his personal possession. The pilot, in an attempt to avoid striking another aircraft immediately in front of him, pulled his aircraft into the air causing it to stall and crash. A passenger in the plane was fatally injured.

Private pilot certificate of Eastman Brown, Bakersfield, Calif., suspended 90 days from January 25 for low flying over the resort area of Bass Lake, California, and for operating an aircraft in a careless manner. While flying at a low altitude over the lake, the aircraft hit some power lines severely damaging the aircraft. The pilot maintained control of the aircraft, gained altitude, and although the aircraft was not in condition for safe operation, flew to Bakersfield, California, approximately 150 miles away.

Private pilot certificate of William R. Holt, Pendleton, Oregon, suspended 60 days from January 18 for low flying in the vicinity of Bennetts Bay, Lake Coeur d'Alene, Idaho.

Private pilot certificate of Mark J. Golibart, Frederick, Maryland, suspended 6 months from January 23 for operating an aircraft over the congested area of Baltimore, Md., at an altitude so low as to barely clear the rooftops.

Aircraft and engine mechanic certificate of George E. Brume, Portland, Maine, suspended 30 days from January 23 for failing to make pertinent entries in the aircraft log book after making a repair and for signing a log book when repairs had not been completed.

Private pilot certificate of Charles J. Spake, Bristol, Tenn., suspended 90 days from January 7 for operating an aircraft during the hours of darkness when the aircraft did not display position lights.

Airline transport pilot certificate of George D. Carpenter, Chicago, Illinois, suspended 30 days from January 8 for failing to file an arrival report.

Commercial pilot certificate of Robert Rollo, Centralia, Illinois, suspended 6 months from January 13 for operating an aircraft during instrument weather when he did not hold a valid instrument rating, for entering a control zone without filing a flight plan or receiving clearance from traffic control, and for landing an aircraft at the Dayton Municipal Airport, Vandalia, Ohio, when the visibility was below minimums.

Private pilot certificate of Jack R. Hilder, Jr., Beaumont, Texas, suspended 60 days from January 12 for operating an aircraft carrying passengers when he had not previously flown that type aircraft.

Student pilot certificate of Homer H. Ellis, Truth or Consequences, New Mexico, suspended 6 months from January 10 for operating an aircraft carrying a passenger. The pilot had accumulated 165 hours of flying time.

Private pilot certificate of Robert E. Barnes, Beaumont, Texas, suspended 6 months from December 11 for making a landing and take-off from a heavily travelled road on Galveston Island, Galveston, Texas.

Commercial pilot certificate of James A. Barnes, Beaumont, Texas, suspended 6 months from January 10 for operating an aircraft at an altitude as low as 75 feet from persons and property on Stewart Beach, Galveston, Texas.

Private pilot certificate of Franklin D. Howe, Van Nuys, Calif., suspended 60 days from January 1 for failing to submit a written report of an accident in which he was involved.

Private pilot certificate of Charles Taylor, San Marino, Calif., suspended 6 months from January 7 for low flying in the vicinity of the Franklin High School, Los Angeles, Calif.

(Continued on page 68)

Accident Reports . . . Civil Aeronautics Board

Crashed on Mountain-Top.—Sufficient evidence upon which to make a determination of the probable cause of the New Tribes Mission accident on June 9, 1950 in South America was not available, the Civil Aeronautics Board said in a report issued last month. However, the Board said that it seems probable that poor or faulty navigation played an important part.

All 12 passengers and a crew of 3 were killed and the aircraft was demolished by the impact and subsequent fire. Three of the passengers were members of the Mission's staff; the others were missionaries and their families enroute to Venezuela.

The aircraft departed from Miami, Fla., for Maracaibo, Venezuela, via Kingston, Jamaica, on June 9, 1950. An instrument flight plan filed at Kingston called for a 4-hour flight at an altitude of 9,500 feet direct to Maracaibo. Radio contact was maintained with Kingston for the first 2 hours, with the last of these reports, a position report, intercepted by Balboa radio and relayed to Maracaibo. Shortly thereafter, Balboa informed the flight that Maracaibo radio was closing down and suggested contacting Balboa to close the flight plan. An hour later the flight informed Balboa that it was over the coast line and descending VFR. This was the last message received from the aircraft.

Prior arrangements called for the aircraft to return to Chico, Calif., and when it had not returned by June 13 a check was made at which time it was found that the plane had never reached its South American destination nor had the flight plan been closed.

When it became apparent that the plane was missing, search and rescue activities were alerted and an intensive search made until about June 28 when it was discontinued. The Mission search plane continued unsuccessfully until July 5, when the base of operations was changed. At that time the natives of an outlying village reported seeing a plane on the date the flight was made. The following day wreckage was sighted near the top of a mountain about 42 miles west of proposed course of the missing plane.

A field representative of the Mission who accompanied the search party reported that the party left on July 7, travelled by jeep and burro for one day and then were forced to go by foot. The site of the crash was reached after 3 days of climbing and cutting trail.

The report further stated that the plane had hit a tree on the top of the mountain, crashed upside down and was almost completely consumed by fire.

A reconstruction of the flight course made it seem likely that the flight intersected the coast line some 30 miles away from where the crew thought they were and at a heading that would bring them to terrain much higher in elevation than expected. The last message of the flight indicates, the Board said, that the crew did not realize that they were off course. Official sunset occurred approximately 30 minutes before the crash and it is probable, said the Board, that darkness had descended by the time of the crash.

Cargo Plane Overloaded.—Engine malfunctioning and overloading the aircraft was the probable cause of the Regina Cargo Airlines accident on May 27, 1950, at Teterboro, N. J., according to a report issued recently by the Civil Aeronautics Board.

The accident occurred about one-half mile from the Teterboro airport shortly after take-off. Only two persons occupied the plane—the captain, who was killed in the crash, and the co-pilot, who was seriously injured. The aircraft was destroyed.

The aircraft, which had been fueled and loaded with cargo at Teterboro, took off about 5:30 p.m. destined for Detroit, Mich., via Fort Wayne, Ind. Ground witnesses reported that the take-off was longer than usual for this model aircraft and tower personnel noticed puffs of black smoke coming from the left engine immediately after take-off.

At an altitude estimated as 200-300 feet, the left engine started to misfire and shortly after became worse. The left propeller was feathered, full power maintained on the right engine, and a left turn started as if to turn back to the airport. At this point the altitude was estimated to be about 400-500 feet. During the turn the air speed fell to 80-85 mph and the aircraft settled. Near the ground the aircraft was leveled. It struck the ground at that attitude and slid along open ground for some 650 feet where it crashed into some large trees.

Both the pilot and co-pilot were thrown clear of the wreckage.

An investigation of the accident by Board investigators disclosed that the gross weight of the aircraft at the time of take-off was approximately 50,000 pounds, an overload of about 2½ tons. No copy of the cargo manifest for the subject flight could be found in the aircraft or in the company's office and investigation brought out that none had been prepared. The co-pilot disclaimed all knowledge of the total weight of the aircraft and there was no evidence that the pilot was aware of it either.

An investigation of the left engine following the accident showed abnormalities in the ignition system. Several sparkplugs, when tested, fired irregularly or not at all and others exceeded the specified limits for gas leakage. There was an abnormally wide range in the gaps, indicating that they had been improperly set.

The magnetos of the left engine were found to be improperly timed and the breaker points were burned and oily. Both magnetos fired intermittently when tested.

Ignition abnormalities to a lesser degree were found in the right engine.

The company inspection sheets showed that the aircraft had accumulated 79 hours and 40 minutes since the last 80-hour inspection. However, log sheets for two previous flights were found in the pilot's briefcase, which was on board the aircraft. These had not been turned in to the company office and indicated an additional 13 hours and 35 minutes of flight time. Thus at the time of the accident the aircraft had flown almost 93 hours since the last 80-hour inspection.

The sustained misfiring of the left engine and the subsequent feathering appears to have resulted from the additive effects of three factors, the Board said. First, the condition of the sparkplugs; second, the condition of the magnetos; and third, under take-off conditions when manifold pressure was greater than that used during the run-up, as is normally the case, misfiring caused by the plugs and magnetos would be accentuated. These three factors appear to have caused a substantial loss of power whereupon the captain feathered the left engine and made a left turn, at which point the aircraft's speed was reduced to an extent that single-engine flight was impossible.

The overloading of the aircraft due to faulty loading and dispatch procedures, coupled with engine malfunctioning due to inadequate maintenance, was determined by the Board to be the probable cause of the crash.

Booklet Providess Airport Design Data

"Airport Design," a publication providing basic information on all phases of airport construction, is on sale for 30 cents a copy by the Superintendent of Documents, Government Printing Office, Washington 25, D.C.

25 Years of Aviation

(Continued from page 57)

vided by the Civil Aeronautics Administration under the Civilian Pilot Training Program and the War Training Service. Through contracts with flight schools, CAA turned out between 1939 and 1944, the staggering total of 435,165 aircraft pilots, glider pilots and instructors.

The bulk of these airmen moved on into the armed forces directly, or into war-supporting activities such as airline operations or contract training schools of the armed forces.

Foundation for A.T.C.—The civilian airlines, it will be recalled, formed the core around which was built the Air Transport Command. Today, any one of the major airlines, when called upon, can provide a greater airlift than the combined lines at the time of Pearl Harbor.

The value of a strong air transportation system in an emergency proved itself in Korea. During the first 8 months of the conflict there, U. S. airlines, both scheduled and non-scheduled, moved almost 40,000 passengers, more than 5,000 tons of cargo, and 943 tons of mail for the military in the Pacific. Translating this into total tonnage, it amounts to 10,743 tons carried by U. S. airlines, compared with 6,535 tons moved by military airplanes. Lt. General Laurence Kuter, commander of the Military Air Transport Service, has paid tribute to this magnificent contribution by U. S. civil aviation.

In recognition of civil aviation's value to defense, the planners of our current mobilization effort have set up procedures to assure continuity of essential operations. The Civil Aeronautics Administration has been assigned a coordinating role in presenting the total requirements of domestic and foreign aviation for consideration by NPA in its allocations of defense materials.

To perform this task, an Office of Defense Requirements has been established within CAA. It works closely with the Air Coordinating Committee, NPA, and Munitions Board in setting and applying the standards necessary to maintain our civil air power.

Aviation Safety

(Continued from page 61)

the value of a device to warn pilots against stalls, for many years a major cause of fatal accidents. A study of private flying accidents made recently by a special CAA committee has resulted in recommendations which brought about Civil Air Regulation amendments designed to cut down pilot error as a factor in the cause of accidents.

Not only have expanded air carrier operations added to the work load of CAA's aviation safety program since 1926, but the CAA has felt the impact of tremendous increases in the number of pilots and aircraft.

Nearly 10 years after the enactment of the Air Commerce Act, there were only 14,806 licensed pilots in the country. Of these, 780 held scheduled air transport ratings. In 1950 alone, the CAA issued 75,725 pilot certificates, and this was the lowest number in the postwar period. In 1947, the CAA issued over 300,000 certificates.

In working with the air carriers, the CAA has not neglected the private pilot. The Aviation Safety Agent is always ready and anxious to help the private pilot—in fact, most of the agents are assigned to private flying activities. Various publications are issued by the CAA to aid these pilots.

In curbing reckless fliers, the CAA is following its original theory that education and cooperation is better than regulation and punishment. The CAA has no desire to set up an organization to police this kind of dangerous flying but is encouraging local authorities to handle the problem of the reckless pilot. Up to now, 36 states have adopted a proposed uniform regulatory law.

Scheduled Air Carrier Operations

[Source: CAB Form 41]

Domestic: March 1951

Operator	Revenue miles	Revenue passengers	Revenue passenger miles (000)	Passenger seat miles (000)	Revenue passenger load factor (percent)	Ton-miles flown: Express	Freight	United States mail
Trunk Lines								
American Airlines	5,441,752	368,387	181,580	234,701	77.37	815,119	3,137,841	1,164,651
Braniff Airways	971,264	63,300	21,585	34,037	63.42	106,478	176,134	134,297
Capital Airlines	2,044,989	142,820	44,897	78,530	57.17	258,661	479,932	160,953
Chicago & Southern Air Lines	643,891	34,747	13,316	19,211	69.31	76,312	74,329	55,727
Colonial Airlines	295,221	18,397	4,757	8,604	55.29	9,349	9,914	9,607
Continental Air Lines	506,136	19,663	7,102	14,441	49.18	13,337	48,478	22,802
Delta Air Lines	1,466,221	76,937	39,419	55,099	71.54	115,908	333,874	157,865
Eastern Air Lines	5,293,553	325,192	167,748	237,474	70.64	549,238	504,089	524,287
Inland Air Lines	245,785	7,360	2,950	5,914	49.88	7,257	11,139	19,249
Mid-Continent Airlines	663,978	27,347	8,385	16,054	52.23	21,309	45,381	35,503
National Airlines	1,515,485	69,348	49,410	65,160	75.83	40,916	478,969	103,401
Northeast Airlines	325,620	30,692	5,762	10,009	57.57	20,937	20,633	11,188
Northwest Airlines	847,943	38,640	23,899	48,005	49.78	155,275	300,860	154,374
Trans World Airlines	4,190,474	163,688	115,557	164,782	70.13	797,590	1,466,002	1,016,439
United Air Lines	4,686,117	221,676	131,016	179,664	72.92	1,073,744	2,362,611	1,453,668
Western Air Lines	700,805	51,803	18,537	27,957	66.31	39,822	68,570	100,378
Trunk Total	29,839,234	1,659,997	835,920	1,199,642	69.68	4,101,252	9,518,756	5,124,389
Feeder Lines								
All American Airways	260,093	13,828	1,950	5,462	35.70	14,099	0	3,991
Bonanza Air Lines	76,935	2,496	636	1,580	40.25	220	1,084	458
Central Airlines	121,746	1,529	275	1,872	14.69	0	0	1,653
Empire Air Lines	104,753	4,044	701	2,200	31.86	1,220	0	1,922
Frontier Airlines								
Helicopter Air Service	27,655	0	0	0	—	0	0	2,073
Lake Central Airlines	93,278	1,949	316	2,046	15.44	12,999	0	1,107
Los Angeles Airways	31,817	0	0	0	—	0	0	4,710
Mid-Continent Airlines	70,478	2,644	477	1,480	32.23	2,699	2,976	1,399
Mid-West Airlines	53,740	169	25	215	11.63	0	0	541
Ozark Airlines	120,609	2,075	324	2,161	14.99	5,233	0	126
Piedmont Aviation	310,222	13,446	3,047	6,515	46.77	9,927	11,937	5,088
Pioneer Air Lines	332,716	12,867	3,407	7,985	42.67	4,413	12,669	8,467
Robinson Airlines Corp.	116,085	7,207	1,114	2,311	48.20	4,800	3,283	2,296
Southern Airways	225,556	7,012	1,279	4,730	27.04	7,208	0	8,126
Southwest Airways	220,604	14,662	2,709	4,633	58.47	4,718	15,500	4,911
Trans-Texas Airways	236,973	6,005	1,467	4,976	29.48	2,540	5,355	3,646
West Coast Airlines	91,795	4,557	653	1,928	33.87	680	4,442	564
Wiggins E. W., Airways	54,087	272	26	216	12.04	0	0	91
Wisconsin-Central Airlines	148,708	5,365	792	2,001	39.58	7,188	0	4,389
Feeder Total [1]	2,697,850	100,127	19,198	52,311	36.70	77,944	57,246	55,558
Territorial								
Caribbean-Atlantic Airlines	62,387	10,540	854	1,693	50.44	0	2,316	849
Hawaiian Airlines	259,463	27,399	3,547	5,527	64.18	9,363	64,496	4,190
Territorial Total	321,850	37,939	4,401	7,220	60.96	9,363	66,812	5,039
Grand Total [1]	32,408,934	1,798,063	859,519	1,259,173	68.26	4,188,559	9,642,814	5,184,986

[1] Does not include Frontier Airlines.

International and Overseas: March 1951

Operator	Revenue miles	Revenue passengers	Revenue passenger miles (000)	Passenger seat miles (000)	Revenue passenger load factor (percent)	Ton-miles flown: Express	Freight	United States mail	Parcel post
American Airlines	250,521	11,111	8,546	12,747	67.04	865	141,699	13,801	0
Braniff Airways	277,768	2,455	5,261	11,650	45.16	0	103,938	8,986	0
Chicago & Southern Air Lines	143,902	2,208	2,725	6,525	41.76	0	66,823	2,846	177
Colonial Airlines	82,584	4,118	3,249	4,294	75.66	0	9,882	1,876	98
Eastern Air Lines	112,629	2,535	2,951	6,716	43.94	0	13,083	17,418	0
National Airlines	128,815	11,437	3,114	6,924	44.97	653	24,559	1,230	0
Northwest Airlines	546,101	4,951	8,912	18,332	48.61	19,030	574,891	151,943	0
Pan American World Airways:									
Atlantic Division	1,293,065	28,767	41,100	63,580	64.64	979,383	0	347,856	95,835
Latin American Division	2,380,286	75,961	58,343	93,943	62.10	2,228,157	0	264,978	0
Alaska Operations	201,409	2,927	3,048	8,409	36.25	391,312	0	36,910	0
Pacific Operations	743,788	6,239	22,306	37,888	58.87	491,464	0	510,606	0
Pan American-Grace Airways	500,508	10,727	12,222	18,207	67.13	208,046	0	30,416	6,378
Trans World Airlines	1,028,441	11,096	28,679	45,743	62.70	0	521,527	309,798	49,633
United Air Lines	259,308	3,046	7,502	13,135	57.11	0	47,577	76,157	0
Uraba, Medellin & Central Airways	9,840	281	92	197	46.70	5,252	0	0	0
Total	7,958,965	177,859	208,050	348,290	59.73	4,324,162	1,503,979	1,774,821	152,121

Domestic Passenger Miles Flown
(Total revenue and nonrevenue, in thousands)

	January	February	March	Total
Trunk	744,984	689,234	864,819	2,299,037
Feeder	18,080	17,205	20,406	55,691
Territorial	3,886	3,613	4,459	11,958
Total	766,950	710,052	889,684	2,366,686

Scheduled Air Carrier Operations

(Continued on page 68)

International and Overseas: January–March 1951, 1950

Operator	Revenue miles January–March		Revenue passengers January–March		Revenue passenger miles (000) January–March		Passenger seat miles (000) January–March		Revenue passenger load factor (percent) January–March	
	1951	1950	1951	1950	1951	1950	1951	1950	1951	1950
American Airlines	715,584	583,436	30,395	21,575	23,714	17,377	37,497	27,451	63.24	63.30
American Overseas Airlines (*ceased operations 9/26/50*)	—	1,194,352	—	25,389	—	37,614	—	58,091	—	64.75
Braniff Airways	784,631	511,906	6,774	3,873	13,768	8,031	33,203	21,865	41.47	36.73
Chicago & Southern Air Lines	409,519	534,409	7,230	5,687	7,874	7,100	18,641	21,993	42.24	32.28
Colonial Airlines	179,014	83,824	8,432	1,768	6,671	1,376	9,308	3,683	71.84	37.36
Eastern Air Lines	235,349	186,160	6,119	4,526	6,678	4,706	14,079	9,233	47.43	50.97
National Airlines	363,485	205,560	33,719	21,385	8,861	5,697	19,796	11,083	44.76	51.40
Northwest Airlines	1,486,509	1,378,410	13,734	8,708	24,736	16,741	52,502	34,474	47.11	48.56
Pan American World Airways:										
Atlantic Division	3,422,642	2,651,298	70,257	26,498	96,259	60,212	153,937	96,500	62.53	62.40
Latin American Division	6,744,913	6,863,058	207,473	187,025	162,824	136,097	260,120	238,689	62.60	57.02
Alaska Operations	535,440	532,417	7,950	7,043	8,445	7,267	23,632	15,753	35.74	46.13
Pacific Operations	2,166,834	2,369,240	16,678	17,815	56,965	46,200	106,031	99,399	53.72	46.48
Pan American-Grace Airways	1,431,502	1,403,359	29,480	24,007	32,260	25,314	52,109	51,958	61.91	48.72
Trans World Airlines	2,832,131	2,686,356	24,849	21,765	66,142	59,683	126,219	89,988	52.40	66.32
United Air Lines	751,756	465,781	8,167	5,166	20,116	12,398	38,048	23,233	52.87	53.36
Uraba, Medellin & Central Airways	26,896	24,464	692	675	227	223	539	433	42.12	51.50
Total	22,086,205	21,674,030	471,949	382,905	535,540	446,036	945,661	803,826	56.63	55.49
Index (1950 = 100)	101.90	100.00	123.25	100.00	120.07	100.00	117.64	100.00	102.05	100.00

Operator	Ton-miles flown							
	Express January–March		Freight January–March		United States mail January–March		Parcel post January–March	
	1951	1950	1951	1950	1951	1950	1951	1950
American Airlines	2,746	2,643	333,273	308,121	39,303	31,061	0	0
American Overseas Airlines (*ceased operations 9/26/50*)	—	624,401	—	0	—	263,290	—	86,295
Braniff Airways	0	0	279,931	126,510	31,631	6,113	0	0
Chicago & Southern Air Lines	0	0	159,795	180,384	8,146	6,515	591	580
Colonial Airlines	0	0	17,010	6,999	3,712	612	397	132
Eastern Air Lines	0	0	36,379	124,250	33,781	13,504	0	658
National Airlines	5,375	56,765	65,988	0	3,064	3,574	0	0
Northeast Airlines	45,762	16,911	1,541,833	1,153,994	438,584	466,841	0	0
Pan American World Airways:								
Atlantic Division	2,552,284	1,764,726	0	0	915,898	559,326	240,890	163,802
Latin American Division	5,830,815	5,535,509	0	0	732,482	678,284	0	0
Alaska Operations	918,551	817,751	0	0	95,079	85,773	0	0
Pacific Operations	1,381,016	1,174,787	0	0	1,352,371	1,249,443	0	0
Pan American-Grace Airways	491,648	424,994	0	0	81,789	87,521	16,760	2,413
Trans World Airlines	0	0	1,493,714	1,284,393	841,645	648,743	130,771	108,581
United Air Lines	0	0	130,279	69,563	205,137	139,326	0	0
Uraba, Medellin & Central Airways	15,073	7,264	0	0	0	0	0	0
Total	11,243,270	10,425,751	4,058,202	3,254,214	4,782,622	4,239,926	389,409	362,461
Index (1950 = 100)	107.84	100.00	124.71	100.00	112.80	100.00	107.43	100.00

Technical Development and Evaluation Center

(Continued from page 60)

airplane flight and landing. It is in the midst also of developing a standard system for marking runways and taxi strips for guidance of pilots on huge airports in conditions of poor visibility.

World-Wide Importance.—TD has grown from a small office in the CAA's headquarters at Washington to an establishment at Indianapolis of recognized, world-wide importance. That city has cooperated generously with the Federal government, and TD and the city have been hosts to visitors from virtually every country in the world where air transportation now is in use. TD's findings are prominent in all technical discussions in the International Civil Aviation Organization at Montreal.

Basically, TD is interested in ideas that will save lives. Inevitably, however, these ideas, when brought to practical application, have shown a dollars-and-cents value—and every one serves to advance air transportation.

Research conducted by the CAA involves a somewhat different approach. Leaving pure aeronautical research to the National Advisory Committee for Aeronautics, the CAA has directed its research lights into the human aspects of flying. Again, safety is the motivating purpose, but promotion of flying generally has resulted from many projects.

An outstanding research project has dealt with stalls, a subject which has agitated flying circles from the beginning of flight. The CAA has proved through scientifically-managed studies in flight, that neither students nor veteran pilots can consistently recognize the approach of stalls in the various airplanes they fly, without benefit of stall-warning instruments. After completion of four studies in this field, the period of education of pilots in stall problems now is under way.

As a basis for improving flying by all pilots, CAA researchers proved that instruments which give the pilots a "picture" of their problem result in fewer improper interpretations and outright mistakes than instruments which give symbolic information.

Financial Gain from Research.—Research has a way of seeming to be purely academic. CAA's studies, however, show practical application to the problems of flight which sometimes can be measured in financial gain to pilots. After a number of studies, the CAA's requirements for medical examinations have been reduced until an actual saving of more than a million dollars a year has been made possible for private pilots.

The development of new courses of flight instruction; the selection of better "patter" for the instructor; standardizing of instruction methods; a survey of the critical requirements of airline pilot's job; the relation between visual ability and flight performance; improvement of the check-flight tests given airline pilots; a method of evaluating the proficiency of air route traffic controllers; these are a few of the projects of CAA research which have wide value throughout the industry, and present facts upon which progress has been made in safety and better air transportation.

Improving the airplane has not been a primary field of CAA activity. It can point with pride, however, to a few accomplishments. Out of a development program in 1933-34, came the first plane which the CAA could certificate as stall-proof. Only one other such plane was so certificated. This development effort was short-lived, but many safety and performance features of today's planes stem from that activity.

More positive were the two developments in better planes which appeared in 1949 and 1950. With a small appropriation, of $150,000, the CAA contracted for development of cross-wind landing gear for five types of planes. Significance of this gear, which allows a plane to land on a single runway regardless of wind direction, is that millions of dollars of airport costs can be saved when planes generally are so equipped.

The second accomplishment, CAA's agricultural plane, also developed under contract, was the suggestion of various groups connected with the rapidly-growing use of the airplane for dusting, spraying, seeding, weeding and fertilizing. This plane, designed especially for its job, and representing the maximum in safety provisions for the pilot and operator, now is being shown to manufacturers and operators, with the thought that it might be manufactured and sold as a replacement for the converted personal planes now generally in agricultural use. This project cost only $50,000.

Marsh Named Head Of Technical Division

E. C. Marsh, a veteran of 13 years in CAA safety work, has been named Chief, Technical Staff Division, Office of Aviation Safety, succeeding John F. Warlick, CAA aviation safety expert called to active duty as a Major in the United States Air Force.

Marsh began his aviation career in 1935 as a stress analyst with the Douglas Aircraft Co., at Santa Monica, Calif., after graduation from the University of California. He had additional experience as an engineer with Convair at San Diego, Calif., in 1936 and 1937 before joining the CAA in July 1937 as an engineer in the West Coast Branch, Aircraft Engineering Section, at Burbank, Calif. He transferred to Washington in June 1942. From October 1942 to October 1945 he was on military duty with the Air Force at Wright Field as a Procurement Officer and was separated from the service as a Major.

He was Chief of the Specifications Staff of the Aircraft Division and for the last 18 months has been on detail as Assistant to the Chief of the Aircraft Division.

Aviation Safety Releases

Issued between May 1, 1951 and May 31, 1951, and obtainable from the CAA Office of Aviation Information, Department of Commerce, Washington 25, D.C.

No.	Date	Subject
345	5/ 1/51	Advisory Service Provided by the CAA Facility Monitoring the ILS.
346	5/21/51	Suction-Air Systems for Air-Operated Gyroscopic Instruments.
347	5/29/51	Department of State Policy with Respect to Passport Holders.

Federal Airways

(Continued from page 62)

controller can direct the pilot to a safe landing. He does this by telling the pilot to "fly up" or "fly down", "fly left" or "fly right"—depending on the information shown on the radar tube.

If an approaching plane is coming in on the instrument landing system, instead of depending on the precision approach radar system, the controller nevertheless monitors the approach by radar. This provides a double check on the position and progress of approaching aircraft and is an extra safety factor.

An airways electronic device just coming into use is Distance Measuring Equipment (DME), which tells a pilot continuously his distance from an omnirange or other fixed point. A series of pulses flashing back and forth between a DME ground station and an aircraft, together with the omnirange indications, pin-point the position of the aircraft at all times, either on or off an airway.

These are only a few of the devices which make today's airways infinitely more complex, and infinitely more useful, than those of 1926. But continued progress and improvement is needed—and is being made—toward the goal of an airways system which will provide clock-like regularity for movement of all air traffic, regardless of weather and volume.

One-Carrier Service Approved

The Civil Aeronautics Board last month authorized extension of All American Airways, Inc. Washington-Atlantic City route segment to New York-Newark via Asbury Park-Long Branch-Monmouth Beach, N.J.

The new service will provide one-carrier service to the New York area for military personnel at Fort Monmouth, N.J., Dover, Del., and Millville, N.J.

Scheduled Air Carrier Operations

(Continued on page 69)

Domestic: January-March 1951, 1950

Operator	Revenue miles January–March		Revenue passengers January–March		Revenue passenger-miles (000) January–March		Passenger seat-miles (000) January–March	
	1951	1950	1951	1950	1951	1950	1951	1950
Trunk Lines								
American Airlines	15,365,826	11,721,187	981,283	561,011	491,918	286,967	657,496	497,628
Braniff Airways	2,797,272	2,720,646	176,202	134,823	59,863	45,095	98,240	92,948
Capital Airlines	5,272,215	4,356,923	358,436	235,720	110,983	68,630	200,173	155,804
Chicago & Southern Air Lines	1,852,960	1,684,344	92,703	64,258	34,664	23,117	53,928	46,465
Colonial Airlines	832,995	649,110	50,297	32,427	12,997	8,720	24,409	16,902
Continental Air Lines	1,488,298	1,332,800	55,648	39,981	20,296	13,967	42,809	37,472
Delta Air Lines	4,166,588	3,608,789	202,550	140,797	102,786	69,998	154,703	122,513
Eastern Air Lines	14,920,380	13,542,562	860,112	584,535	442,941	315,066	668,649	503,780
Inland Air Lines	709,372	676,001	21,604	18,216	8,479	6,764	17,031	12,920
Mid-Continent Airlines	1,867,356	1,982,198	82,967	74,201	25,161	21,666	46,162	41,626
National Airlines	4,077,704	3,092,537	171,788	106,798	123,287	71,635	175,330	122,419
Northeast Airlines	941,976	755,941	86,465	59,040	16,166	10,939	29,087	24,246
Northwest Airlines	2,884,379	4,674,263	112,973	145,040	73,323	85,293	150,708	190,631
Trans World Airlines	11,437,466	10,164,635	416,647	278,700	296,766	189,669	450,970	353,831
United Air Lines	12,966,528	11,952,520	597,635	420,377	352,796	244,123	502,645	443,277
Western Air Lines	2,019,135	1,727,441	137,568	69,096	49,424	25,915	50,142	63,507
Trunk total	83,600,450	74,641,897	4,404,878	2,965,020	2,221,850	1,487,564	3,352,482	2,725,969
Index (1950 = 100)	112.00	100.00	148.56	100.00	149.36	100.00	122.98	100.00
Feeder Lines								
All American Airways	691,675	624,719	34,673	18,845	4,845	2,612	14,525	13,119
Bonanza Air Lines	221,280	215,216	6,793	3,510	1,739	881	4,537	4,145
Central Airlines	344,049	401,201	3,994	1,333	716	157	5,351	1,204
Empire Air Lines	204,422	256,633	10,517	8,752	1,847	1,629	6,393	5,389
Frontier Airlines [1]	695,151	726,097	12,683	10,413	3,180	2,796	13,903	13,654
Helicopter Air Service	74,843	74,301	0	0	0	0	0	0
Lake Central Airlines	248,669	144,175	4,751	1,256	778	195	5,482	1,714
Los Angeles Airways	87,293	81,365	0	0	0	0	0	0
Mid-Continent Airlines	217,513	—	8,134	—	1,562	—	4,568	—
Mid-West Airlines	176,367	336,512	565	1,328	75	193	707	1,347
Ozark Air Lines	279,391	—	5,484	—	775	—	4,533	—
Piedmont Aviation	869,114	750,599	33,430	20,189	7,676	4,165	18,252	15,763
Pioneer Air Lines	892,334	913,032	34,405	26,215	9,108	7,043	21,416	21,993
Robinson Airlines	309,144	243,013	17,929	9,387	2,765	1,485	6,104	4,634
Southern Airways	624,432	418,858	17,283	5,336	3,140	935	13,070	8,755
Southwest Airways	592,857	551,211	32,457	19,753	6,125	3,609	12,461	11,576
Trans-Texas Airways	662,910	721,433	16,001	10,763	3,909	2,476	13,921	15,149
West Coast Airlines	264,408	261,754	11,519	10,032	1,639	1,397	5,552	5,497
Wiggins, E. W. Airways	154,581	70,443	830	369	77	35	617	281
Wisconsin-Central Airlines	422,282	458,443	11,367	8,511	1,720	1,290	4,162	3,678
Feeder total [1]	8,132,715	7,249,005	262,815	155,992	51,676	30,898	155,554	127,898
Index (1950 = 100)	112.19	100.00	168.48	100.00	167.25	100.00	121.62	100.00
Territorial Lines								
Caribbean-Atlantic Airlines	162,951	142,652	27,470	19,632	2,162	1,590	4,418	3,513
Hawaiian Airlines	721,576	644,083	74,539	70,104	9,625	9,120	15,548	14,200
Territorial total	884,527	786,735	102,009	89,736	11,787	10,710	19,966	17,713
Index (1950 = 100)	112.43	100.00	113.68	100.00	110.06	100.00	112.72	100.00
Grand total [1]	92,617,692	82,677,637	4,769,702	3,210,748	2,285,313	1,529,172	3,528,002	2,871,580
Index (1950 = 100)	112.02	100.00	148.55	100.00	149.45	100.00	122.86	100.00

[1] March 1951 operations for Frontier Airlines not included.

Suspensions--Revocations

(Continued from page 65)

Private pilot certificate of Jack R. Ballack, Long Beach, Calif., suspended 30 days from December 25 for operating an aircraft carrying a passenger on a flight into a danger area without obtaining permission for such operation and for failing to familiarize himself with available information pertinent to his proposed flight.

Revocations

Private pilot certificate of Douglas D. Howard, Spokane, Wash., revoked for operating an aircraft while under the influence of intoxicating liquor and for permitting a person to be carried in the aircraft who was under the influence of intoxicants.

Student pilot certificate of Harry L. Bell, Pendleton, Ore., revoked for operating an aircraft on a passenger carrying flight.

Private pilot certificate of William W. Van Dyke, Salt Lake City, Utah, revoked for low flying over a congested area of Salt Lake City, for flying as low as 50 feet from automobiles on a highway in the vicinity of Lake Point, Utah, and for operating an aircraft after sunset without displaying position lights on the aircraft.

Student pilot certificate of Ollin R. Hayes, Pittsburg, Calif., revoked for low flying over a crowded swimming pool and playground in the vicinity of Pittsburg, for performing acrobatic maneuvers at a low altitude, and for flying outside the local flight area designated by his flight instructor.

Private pilot certificate of Raymond J. Stevens, Santa Clara, Calif., revoked for operating an aircraft carrying passengers for hire and for flying in instrument weather when he did not hold an instrument rating and when the aircraft was not equipped for instrument flying.

Student pilot certificate of Edward H. Waldorf, New Orleans, La., revoked for operating an aircraft carrying a passenger.

Commercial pilot certificate of Paul E. Porter, Chillicothe, Ohio, revoked for "buzzing" houses in a congested area of Chillicothe.

Student pilot certificate of James D. Bretall, Bessemer, Mich., revoked for operating an aircraft on a passenger carrying flight.

Private pilot certificate of Michael B. Benson, Detroit, Mich., revoked for failing to familiarize himself with available information pertinent to his intended flight, for operating an aircraft after the hours of darkness when the plane was not equipped with position lights, for failing to make a written report of an accident, and for other violations. After running out of gas the pilot made a forced landing in a field in the vicinity of Bluffington, Ohio. The following morning, before daybreak, he attempted a take-off from a short field but the aircraft stalled and crashed.

Private pilot certificate of Robert T. Hatton, Georgetown, Ky., revoked for operating an aircraft carrying a passenger when the aircraft had not been given an annual inspection. The aircraft stalled on the climb after take-off from Paines Airport, Kenton, Ky., and crashed into a lake adjacent to the field.

Student pilot certificate of Lawrence A. Yuknis, East Moline, Ill., revoked for operating an aircraft on a passenger carrying flight. The aircraft crashed after striking some high tension wires while attempting a landing at the Miller Airport, Silvis, Ill.

Private pilot certificate of Harry T. Lucas, Jr., Roanoke, Va., revoked for low flying while carrying a passenger over the congested area of Sulphur Springs, Fla., and for performing acrobatics over a congested area and within a civil airway.

Student pilot certificate of Arthur B. Aydelotte, Margate, N. J., revoked for operating an aircraft other than a type authorized and for carrying a passenger on a flight in the vicinity of Atlantic City, N. J.

Private pilot certificate of Edward A. Keerans, Baltimore, Md., revoked for operating an aircraft at an altitude as low as 25 feet above the housetops in the vicinity of Sue Island, Middle River, Md., and flying up and down the river at that altitude over boats on the river.

Private pilot certificate of Edward G. Henry, Philadelphia, Pa., revoked for flying over the Delaware River at an altitude so low as to barely clear the heads of persons in boats and for flying under the Burlington-Bristol bridge which has a clearance of 64 feet above the water.

Scheduled Air Carrier Operations

(Continued from page 68)

Domestic: January-March 1951, 1950

Operator	Revenue passenger load factor (percent) January–March		Ton-miles Flown: Express January–March		Freight January–March		United States mail January–March	
	1951	1950	1951	1950	1951	1950	1951	1950
Trunk Lines								
American Airlines	74.82	57.67	2,493,409	1,300,205	9,028,417	6,575,521	3,376,492	2,107,256
Braniff Airways	60.94	48.52	318,903	228,101	472,243	349,864	390,402	294,146
Capital Airlines	55.44	44.05	676,507	493,088	1,268,075	1,776,391	453,786	326,969
Chicago & Southern Air Lines	64.28	49.75	199,098	125,492	200,890	180,673	160,168	132,345
Colonial Airlines	53.25	51.59	25,198	15,782	27,338	22,426	26,840	21,694
Continental Air Lines	47.41	37.27	35,825	20,793	150,413	84,352	62,956	47,546
Delta Air Lines	66.44	57.14	338,949	200,195	1,023,794	594,226	438,146	286,747
Eastern Air Lines	66.24	62.54	1,665,845	980,801	1,366,362	2,931,952	1,469,074	1,219,785
Inland Air Lines	49.79	52.35	21,721	11,101	34,600	22,284	51,958	24,073
Mid-Continent Airlines	54.51	52.05	65,508	49,143	132,310	93,750	98,037	73,075
National Airlines	70.32	58.52	129,812	187,391	1,323,763	617,054	265,650	191,107
Northeast Airlines	55.58	45.12	59,757	37,989	55,588	41,810	34,723	27,287
Northwest Airlines	48.65	44.74	530,830	370,561	1,060,967	1,302,729	522,848	662,856
Trans World Airlines	65.81	53.60	2,335,627	1,160,513	3,981,131	2,800,233	2,772,080	1,988,101
United Air Lines	70.19	55.07	3,106,266	1,827,788	6,546,454	5,795,701	3,895,576	2,645,190
Western Air Lines	61.67	40.81	110,007	98,221	179,349	136,751	272,923	156,190
Trunk total	66.27	54.57	12,113,262	7,107,164	26,851,694	23,325,717	14,291,659	10,204,367
Index (1950 = 100)	121.44	100.00	170.44	100.00	115.12	100.00	140.05	100.00
Feeder Lines								
All American Airways	33.36	19.91	39,737	18,995	0	0	11,562	8,925
Bonanza Air Lines	38.33	21.25	564	242	2,602	1,567	1,222	1,079
Central Airlines	13.38	13.04	0	0	0	0	4,691	3,917
Empire Air Lines	28.89	30.23	3,890	2,695	0	0	5,827	4,030
Frontier Airlines [1]	22.87	20.48	9,720	10,141	30,183	30,428	15,873	12,542
Helicopter Air Service	—	—	0	0	0	0	5,539	4,146
Lake Central Airlines	14.19	11.38	34,880	2,262	0	0	4,012	806
Los Angeles Airways	—	—	0	0	0	0	12,482	9,925
Mid-Continent Airlines	34.19	—	11,829	—	9,965	—	4,227	—
Mid-West Airlines	10.61	14.33	0	0	0	0	1,740	3,900
Ozark Air Lines	17.10	—	15,265	—	0	—	1,983	—
Piedmont Aviation	42.06	26.42	25,761	11,859	30,813	17,720	14,074	9,925
Pioneer Air Lines	42.53	32.02	12,306	9,691	33,395	26,287	24,928	24,475
Robinson Airlines	45.30	32.05	15,284	7,573	9,975	8,089	6,275	5,126
Southern Airways	24.02	10.68	16,716	7,230	0	0	20,936	9,473
Southwest Airways	49.15	31.18	11,081	7,638	44,962	29,391	12,680	10,723
Trans-Texas Airways	28.08	16.34	7,385	7,217	15,496	12,175	9,637	12,422
West Coast Airlines	29.52	25.41	2,230	1,987	10,852	0	1,568	2,032
Wiggins, E. W. Airways	12.48	12.46	0	0	0	0	306	332
Wisconsin-Central Airlines	41.33	35.07	14,566	8,105	0	0	10,538	7,035
Feeder total [1]	33.22	24.16	221,214	95,635	188,243	125,657	170,100	130,813
Index (1950 = 100)	137.50	100.00	231.31	100.00	149.81	100.00	130.03	100.00
Territorial Lines								
Caribbean-Atlantic Airlines	48.94	45.26	0	0	6,797	6,933	2,310	2,084
Hawaiian Airlines	61.91	64.23	25,558	29,277	163,321	95,908	10,546	12,411
Territorial total	59.04	60.46	25,558	29,277	170,118	102,841	12,856	14,495
Index (1950 = 100)	97.65	100.00	87.30	100.00	165.42	100.00	88.69	100.00
Grand total [1]	64.78	53.25	12,360,034	7,232,076	27,210,055	23,554,215	14,474,615	10,349,675
Index (1950 = 100)	121.65	100.00	170.91	100.00	115.52	100.00	139.86	100.00

[1] March 1951 operations for Frontier Airlines not included.

Airport Developments

(Continued from page 59)

The Act provided Federal participation on a fund-matching basis with local units of Government. It further provided that appropriations would be made annually and would not exceed 100 million in any fiscal year. The CAA was instructed to make a survey each year under the program and to make recommendations for airport construction or improvements for the next 3 years. Known as the National Airport Plan, it was designed to forecast the airport needs of the country 3 years in advance. Communities listed in the Plan would become eligible for actual allocations of funds for airport work, within the limits of the annual appropriation.

In making actual grants under the Federal Aid Airport Program, the CAA determined "aeronautical need" as the sole basis for such grants to cities and towns requesting airport aid.

Appropriations Made.—Five appropriations have been made under the Federal Airport Act, totaling $181,200,000 in Federal funds. They include: $45,000,000 for fiscal year 1947; $32,500,000 for fiscal year 1948; $40,000,000 for fiscal year 1949; $39,500,000 for fiscal year 1950 and $24,200,000 for fiscal year 1951. In September of 1951 the Congress extended the life of the Act another 5 years without authorizing any additional funds.

Accomplishments under the Federal Aid Airport Program have been great. Statistics as of May 1 reveal the CAA has made grant offers to 1,009 different airports, representing $140,350,426 in Federal funds. Grant agreements, that is, grant offers accepted by local sponsors, are or have been in effect at 1,002 airports. A total of 756 construction or development projects has been physically completed at 544 different airports at an expenditure of $42,424,984 in Federal funds. Over $50,000,000 worth of projects were under construction as of May 1.

In the years following the close of the war, the CAA participated in the disposal of surplus airports. The CAA's function was to survey the airports declared surplus by the military establishments and recommend to the War Assets Administration what portions of the fields should be conveyed to cities as airport property. The law was later amended to permit the CAA to make recommendations for transfer of property on airports that could be used to produce revenue from non-aviation activities.

During the disposal program, more than 500 airports were transferred to local subdivisions. The CAA, through the Office of Airports, now has the continued responsibility of supervising the provisions of deeds.

Civil Aviation Highlights

	1951	1950
Airports and airfields recorded with CAA *May 1*	6,332	6,472
By type: [1]		
Commercial	2,219	2,518
Municipal	2,278	2,222
CAA Intermediate	70	134
Military	328	334
All others	1,437	1,264
a. Private use	1,282	1,123
b. Miscellaneous government	155	141
Civil airports and airfields by class: [2]		
Total	6,004	6,138
Class I and under	3,947	4,048
Class II	959	992
Class III	507	505
Class IV	372	374
Class V	136	137
Class VI and over	83	82
Total U. S. civil aircraft, *May 1*	91,115	92,535
Scheduled air carrier aircraft, *May 1*	1,216	1,142
Civil Aircraft production, *March*		
Total	273	326
1- and 2-place models	62	98
3-, 4-, and 5-place models	200	224
Over 5-place models	11	4
Certificates approved, *March*		
Student pilots	2,896	3,318
Private pilots	1,454	1,978
Commercial pilots	406	444
Airline transport pilots	101	60
Mechanics (original certificates)	337	751
Ground instructors (original certificates)	55	148
Flight instructor ratings	119	144
Instrument ratings	166	112
Control tower operators	55	65
Traffic control activity, *March*		
Aircraft operations, CAA airport towers	1,306,556	1,246,397
Fix postings, CAA airway centers	1,164,249	966,302
Instrument approaches, CAA approach control towers	31,451	22,813
AIRPORT OPERATIONS		
Washington National, *April*		
Scheduled air carrier:		
Passengers departing	103,864	67,599
Passengers arriving	102,639	67,231
Aircraft arrivals and departures	11,449	9,601
Other aircraft arrivals and departures	4,089	2,878
San Francisco Municipal, *March*		
Scheduled air carrier:		
Passengers departing	[3]	40,839
Passengers arriving	[3]	40,518
Aircraft arrivals and departures	8,402	6,409
Other aircraft arrivals and departures	4,461	3,581
Oakland Municipal, *March*		
Scheduled air carrier:		
Passengers departing	9,445	4,014
Passengers arriving	9,263	3,791
Aircraft arrivals and departures	4,968	4,422
Other aircraft arrivals and departures	12,802	13,759
Miami International, *March*		
Scheduled air carrier:		
Passengers departing	102,697	83,006
Passengers arriving	100,164	78,982
Aircraft arrivals and departures	10,718	10,056
Other aircraft arrivals and departures	12,358	11,944
Los Angeles International, *March*		
Scheduled air carrier:		
Passengers departing	70,776	44,714
Passengers arriving	70,440	43,178
Aircraft arrivals and departures	9,153	8,379
Other aircraft arrivals and departures	7,365	6,704

[1] Airport type definitions: Commercial—Public use and public services, private control. Municipal—Public use and public services, public control. CAA Intermediate—No public services, CAA control. Military—No public services, military control. Other—(a) No public services, private control; (b) No public services, Federal Government Control (Forest Service, etc.)

[2] The following is a breakdown of paved airports and unpaved airfields by class:

Class of Facility	Paved Airports	Unpaved Airfields	Total
Class I and under	111	3,836	3,947
Class II	176	783	959
Class III	338	169	507
Class IV	334	38	372
Class V	129	7	136
Class VI and over	81	2	83
Total	1,169	4,835	6,004

[3] Not available.

Regulations of The Administrator

Through June 1, 1951

Note: Regulations of the Administrator marked with an asterisk (*) on the list given below may be obtained from the Superintendent of Documents, United States Government Printing Office, Washington 25, D. C., at the prices indicated. Remit check or money order, made payable to the Superintendent of Documents, directly to the Government Printing Office. Copies of amendments may be obtained free of charge from the Office of Aviation Information, CAA, Washington 25, D. C., or may be found in the Federal Register for the dates indicated in parentheses. Copies of the Federal Register are obtainable from the Superintendent of Documents.

Organization

*Part 400—Organization and Functions. (10¢.)

Procedures

*Part 405—General Procedures. (5¢.)
*Part 406—Certification Procedures. (10¢.)
*Part 407—Recordation Procedures. (5¢.)
*Part 408—Enforcement Procedures. (5¢.)
Amendment 1. (April 26, 1951.)

Rules

Airmen

*Part 450—Inter-American Aviation Training Grants. (5¢.)

Aircraft

Part 501—Aircraft Registration Certificates. (April 28, 1951.)
*Part 502—Dealers' Aircraft Registration Certificates. (5¢.)
*Part 503—Recordation of Aircraft Ownership. (5¢.)
*Part 504—Recordation of Encumbrances Against Specifically Identified Aircraft Engines. (5¢.)
*Part 505—Recordation of Encumbrances Against Aircraft Engines, Propellers, Appliances, or Spare Parts. (5¢.)
Part 506—Airworthiness Directive Recordation. (May 1, 1951.)
Part 514—Technical Standard Orders — C Series — Aircraft Components. (January 25, 1951.)

Airports

*Part 550—Federal Aid to Public Agencies for Development of Public Airports. (10¢.)
(Amendments 1–14 available from CAA.)
*Part 555—Acquisition of Government-owned Lands for Public Airport Purposes. (5¢.)
*Part 560—Reimbursement for Damage to Public Airports by Federal Agencies. (10¢.)
(Amendment 1 available from CAA.)
*Part 570—Rules of Washington National Airport. (5¢.)
(Amendment 1 available from CAA.) Amendment 2 (March 28, 1951).
*Part 575—Federal Civil Airports on Canton and Wake Islands. (5¢.)

Air Navigation

*Part 600—Designation of Civil Airways (including amendments 1 through 18). (15¢.)
(Amendments 19–49 available from CAA.)
*Part 601—Designation of Control Areas, Control Zones and Reporting Points (including amendments 1 through 22). (15¢.)
(Amendments 23–53 available from CAA.)
*Part 612—Aeronautical Fixed Communications. (5¢.)
Part 617—Airport Traffic Control Rules. (April 21, 1951.)
*Part 620—Security Control of Air Traffic. (5¢.)
Amendment 1 (February 15, 1951).
*Part 625—Notice of Construction or Alteration. (5¢.)

Miscellaneous

Part 635—Reproduction and Dissemination of Current Examination Materials. (Available without charge from CAA.)

New CAA Safety Film Available

"Safety in Aviation," a new CAA film, is now available to clubs, schools and other borrowers through the Washington and regional film libraries.

The film tells the story of the cooperative work of CAA and the industry for aviation safety. It begins with the process of approving a new design, takes it on through its production in quantity and maintenance in service, then shows how all classes of airmen acquire and prove their skill, and finally, how skilled personnel and airworthy aircraft are combined in safe flight operations. It runs 28 minutes, and is in 16 mm black and white with sound track.

The film was produced by the CAA Office of Aviation Information, for and with the cooperation of the CAA Office of Aviation Safety. It completes a series of five such films, the others being "A Plane is Born," "Safe Aircraft," "Safe Airmen," and "Safe Flight Operations."

Air Regulations . . . . June 1, 1951

TITLE	No.	Price	Date	Number of Amendments	Applicable Special Regulations
AIRCRAFT					
Certification, Identification, and Marking of Aircraft and Related Products	1	$0.05	1/15/51		
Airplane Airworthiness; Normal, Utility, Acrobatic, and Restricted Purpose Categories	[1] 3	.15	11/ 1/49	6	SR-358,360
Airplane Airworthiness	4a	.20	4/ 7/50		SR-358,360
Airplane Airworthiness; Transport Categories	[1] 4b	.25	7/20/50	3	SR-358,360 361
Rotorcraft Airworthiness	6	.10	1/15/51		SR-358,360
Aircraft Airworthiness; Restricted Category	8	.05	10/11/50		
Aircraft Airworthiness; Limited Category	9	.05	11/11/49	1	
Aircraft Engine Airworthiness	13	.05	8/ 1/49	2	SR-358
Aircraft Propeller Airworthiness	14	.05	11/ 1/49	2	SR-358
Aircraft Equipment Airworthiness	15	.05	11/ 1/49	3	SR-358,360
Aircraft Radio Equipment Airworthiness	16	.05	2/13/41		
Maintenance, Repair, and Alteration of Certificated Aircraft and of Aircraft Engines, Propellers, and Instruments	18	.05	8/15/49		
AIRMEN					
Pilot Certificates	20	.05	8/ 1/49	8	
Airline Transport Pilot Rating	21	.05	8/15/49	2	
Lighter-than-air Pilot Certificates	22	.05	11/ 1/49	6	
Mechanic Certificates	24	.05	9/ 1 49	4	SR-348
Parachute Rigger Certificates	25	.05	9/ 5/50	1	
Air-traffic Control-tower Operator Certificates	26	.05	11/ 1/49	4	
Aircraft Dispatcher Certificates	27	.05	11/ 1/49	3	
Physical Standards for Airmen	29	.05	10/ 1/49	2	
Flight Radio Operator Certificates	33	.05	2/15/50	4	
Flight Navigator Certificates	34	.05	11/ 1/49	3	
Flight Engineer Certificates	35	.05	11/ 1/49	3	
OPERATION RULES					
Air Carrier Operating Certification	40	.05	9/ 1/49		SR-346, 349, 351, 353, 356
Certification and Operation Rules for Scheduled Air Carrier Operations Outside the Continental Limits of the United States	41	.05	11/15/49	3	SR-349, 356, 360
Irregular Air Carrier and Off-Route Rules	42	.10	6/ 1/49	7	SR-337, 349, 350, 360
General Operation Rules	43	.05	8/ 1/49	6	SR-360
Foreign Air Carrier Regulations	44	.05	9/ 1/49		
Commercial Operator Certification and Operation Rules	45	.05	11/15/49	1	SR-337, 349, 356
Operation of Moored Balloons	48	.05	9/ 1/49		
Transportation of Explosives and Other Dangerous Articles	49	.10	7/20/49		
AIR AGENCIES					
Airman Agency Certificates	50	.05	10/ 1/49	3	SR-354,355
Ground Instructor Rating	51	.05	10/10/49	2	
Repair Station Rating	52	.05	10/15/49		
Mechanic School Rating	53	.05	10/15/49		
Parachute Loft Certificates and Ratings	54	.05	10/15/49	1	
AIR NAVIGATION					
Air Traffic Rules	60	.10	8/ 1/49		
Scheduled Air Carrier Rules	61	.10	9/ 1/49	4	SR-346, 349, 350, 356, 360
Notice and Reports of Aircraft Accidents and Missing Aircraft	62	.05	5/ 1/49		

[1] Certain aircraft may comply with the provisions of this Part or Part 4a.

NOTE: Civil Air Regulations are on sale at the prices indicated by the Superintendent of Documents, Government Printing Office, Washington 25, D. C. Remittances should be by check or money order, payable to the Superintendent. Amendments and special regulations may be obtained from the Publications Section, Civil Aeronautics Board, Washington 25, D. C.

CAA Manuals and Supplements . . . June 1, 1951

TITLE	No.	Price	Date	No. of Supplements	Amending Release
Production Certificates	02	$0.10	8/ 1/46		
Airplane Airworthiness; Normal, Utility, Acrobatic, and Restricted Purpose Categories	3	Free		6	
Airplane Airworthiness	04	.75	7/ 1/44		Nos. 193, 202
Airplane Airworthiness; Transport Categories	4b	Free		5	
Rotorcraft Airworthiness	6	Free	4/ 3/51	1	
Aircraft Airworthiness; Restricted Category	8	.60	1/ 1/51	1	
Aircraft Propeller Airworthiness	14	.20	5/ 1/46		
Aircraft Equipment Airworthiness	15			(Being revised)	
Aircraft Radio Equipment Airworthiness	16	Free	2/13/41		Nos. 62, 272
Maintenance, Repair, and Alteration of Certificated Aircraft, Engines, Propellers, and Instruments	18	1.25	8/ 1/49		
Pilot Certificates	20	Free	6/16/50	1	
Air-Traffic Control-Tower Operator Certificates	26	Free		3	
Aircraft-Dispatcher Certificates	27	Free		2	
Flight Radio Operator Certificates	33	Free	6/16/50	2	
Flight Navigator Certificates	34	Free		1	
Flight Engineer Certificates	35	Free	1/ 2/51	1	
Air Carrier Operating Certification	40	Free		3	
Certification and Operation Rules for Scheduled Air Carrier Operations Outside the Continental Limits of the United States	41	Free		11	
Irregular Air Carrier Certification and Operation Rules	42	1.00	9/ 1/49	2	
General Operation Rules	43	Free		2	
Airmen Agency Certificates	50	.15	5/15/46	3	No. 254
Repair Station Rating	52	Free		1	
Mechanic School Rating	53	Free	5/—/40		
Parachute Loft Certificates and Ratings	54	.15	7/ 1/48		
Instrument Approach Procedure	60	Free		5	
Scheduled Air Carrier Rules	61	Free		7	

NOTE: Manuals for which a price is listed may be obtained from the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. Remittances should be by check or money order, payable to the Superintendent. Items marked "free" may be obtained from the CAA Office of Aviation Information, Department of Commerce, Washington 25, D. C.

Proposed Regulation Gives Manufacturers Test Responsibilities

The Civil Aeronautics Administration will allow qualified manufacturers of small aircraft to assume full responsibility for testing and certifying their product, under a proposed new regulation of the Administrator.

The plan would allow manufacturers of planes weighing not more than 5,000 pounds and carrying not more than 5 persons to certify to CAA that they are designed and manufactured in accordance with safety standards set by the Civil Air Regulations.

Certification procedures would be handled by a manufacturer through a responsible person in his organization, known as a Designated Aircraft Certification Representative (DACR), who would be approved by the CAA and who would follow procedures established by the CAA.

Under present procedures, the CAA conducts many of the inspections, examinations, and tests necessary for the issuance of type (new design) and production certificates. Under the proposed optional procedure, all of the steps would be handled by the DACR, except final issuance of the certificates, which would be done by the CAA. The DACR would be authorized to issue airworthiness certificates.

The new procedures could be used for type certification, changes in the type design of airplanes for which the manufacturer holds or obtains a type certificate, the amendment of the production certificate held by the manufacturer to include additional airplane models or additional types for which he holds or obtains type certificates, and the issuance of airworthiness certificates for airplanes of any type for which the manufacturer holds or obtains type and production certificates.

Any manufacturer operating under the option will be required to maintain an adequate staff of engineering, flight test, production, and inspection personnel to comply with the Civil Air Regulations. A complete file of reports on type inspections, available for CAA inspection, would be kept by the participating manufacturer.

Civil Aircraft Shipments Increase During February

Shipments of civil aircraft totaled 239 planes weighing 288,400 airframe pounds during February 1951, according to a report issued jointly by the Civil Aeronautics Administration and the Bureau of the Census, Department of Commerce. Comparatively, shipments of civil aircraft for February 1950 amounted to 225 planes and 412,700 airframe pounds.

Unfilled orders for civil transports advanced another 62 planes during February 1951.

Detailed civil aircraft shipment figures for January and February 1951, as well as for February 1950 follow:

Civil Aircraft Shipments

Item	1951		1950
	February	January	February
Number (total)	239	255	225
Number by place:			
1- and 2-place	70	90	57
3-place and over	169	165	168
Number by total rated horsepower, all engines:			
1-99 hp	30	29	46
100 hp. and over	209	226	179
Airframe weight (thousand pounds)	288.4	348.3	412.7
Value (thousand dollars)	$9,078	$10,251	$12,467
Complete aircraft	3,667	4,859	7,911
Aircraft parts	2,689	2,462	2,812
All other products	2,722	2,930	1,744

Dr. W. R. Stovall Chosen New Aero Medical Head

W. R. Stovall, M.D., Chief of the CAA's Medical Division, was made President-Elect of the Aero Medical Association at its Annual Convention Meeting held in Denver, Colorado, last month. He will take office in 1952, succeeding Maj. Gen. Harry G. Armstrong, Surgeon General, U. S. Air Force, this year's President. The membership of the Association is made up of physicians from practically every country in the world, excepting Russia and her satellites.

Dr. Stovall, a 45-year-old native of Texas and graduate of Baylor University, has been a Flight Surgeon since 1937 and Medical Director of the Civil Aeronautics Administration and its predecessor organizations since 1938. During World War II he directed the activities of the Civilian Pilot Training Program and War Training Service, and in 1944 he organized CAA's research laboratories in Houston, and in Oklahoma City when it was later transferred there.

Notable contributions have been made to medical and engineering knowledge as a result of the laboratories research on such subjects as explosive decompression, shoulder harness design, human reach measurement, and emergency evacuation procedures.

"Probably the most important development of the Medical Division from the standpoint of private flying," Dr. Stovall said, "was the perfection of graduated medical flight test procedures. These procedures permit individual consideration to applicants with visual and orthopedic defects, in place of the arbitrary standards formerly used, and have resulted in a more equitable application of the medical standards for airmen."

Dr. Stovall stated that rapid progress is being made in the Division's research work in the field of cardiography. "The work in this field and in others," he said, "should enable us to be better able to predetermine the presence of conditions that may later affect the safety of the pilot. Already the results have allowed us to make favorable modifications of cardiac requirements."

CAA and CAB Releases

Copies of CAA releases may be obtained from the CAA Office of Aviation Information. CAB releases are obtainable from the Public Information Section of the Board.

Administration

CAA to Allow Small Plane Makers to Test Own Products—(CAA 51-25) (May 14).

CAA Publishes New Book: "How to Organize and Operate a Flying Club"—(CAA 51-26) (May 14).

U. S. Delegates Aid in Setting International Jet Transport Plane Standards—(CAA 51-27) (May 18).

Florida Leads all States in 1950 Air Marker Program—(CAA 51-28) (May 19).

Horne Names Lee Deputy Head of CAA; Beardslee, Tippets Get Top Airways Posts—(CAA 51-29) (May 22).

Egypt Sends Thanks for Help of CAA on Airport Program—(CAA 51-30) (June 1).

Address by Charles F. Horne, Administrator of Civil Aeronautics, Before Aeronautical Training Society, Mayflower Hotel, Washington, D. C., (May 28, 1951) "Problems and Prospects of Non-Airline Aviation."

Board

CAB Authorizes Trans-Pacific Airlines to Carry Mail—(CAB 51-35) (April 27).

Board Approves Through Plane Service Agreements Between Miami, Fla. and the West Coast—(CAB 51-36) (May 1).

Lee Named Deputy; Beardslee, Tippets Get Airway Posts

Charles F. Horne, Administrator of Civil Aeronautics, named Frederick B. Lee as his Deputy Administrator for Operations, the number two job in the CAA. John M. Beardslee was promoted to Director, Office of Federal Airways, and Joseph H. Tippets was named Deputy Director of that office.

Mr. Lee joined the CAA in February 1946, as Program Planning Officer, later became Executive Assistant to the Administrator, and most recently has been Deputy Administrator for Program Planning. The post Mr. Lee now assumes has not been filled since Donald W. Nyrop left it last October to become Administrator.

Mr. Lee has been a licensed pilot since 1930, and owns a four-place plane. He practiced law for ten years until he went on active duty as a naval aviator in May 1941. He joined the CAA shortly after he was placed on the inactive list with the rank of Commander.

Mr. Beardslee moves up from Deputy Director, Office of Federal Airways, to the position of Director. "Jack" Beardslee has been connected with government aviation activities since 1928. After graduating from Michigan State College in that year with a civil engineering degree, he joined the Airways Division of the Department of Commerce. He held a variety of airways engineering positions on the West Coast and in Alaska, until 1942, when he was made manager of the CAA Pacific Islands Office in Honolulu.

Because of increasing activities, the scope of the office was enlarged, and Mr. Beardslee became Regional Administrator. He was called to Washington early in 1950 to become Deputy Director, Office of Federal Airways.

Mr. Beardslee's successor as Deputy Director is Joseph H. Tippets, formerly Chief, Maintenance Engineering Division. A youthful veteran of 20 years in civil and military aviation he joined the Navy in 1931, serving on a variety of electronics assignments, including flight radio observer. He was given a special order discharge in 1937 to join the Bureau of Air Commerce, predecessor of CAA.

Mr. Tippets was assigned to Alaska by CAA in June 1940, and participated in the tremendous expansion of Alaskan aviation activities during the next seven years, helping to plan and install the network of radio communications and navigation aids which now serve the territory.

CAB Announces World Safety Record for U. S. Domestic Air Carriers—(CAB 51-37) (May 4).

CAB Sets Hearing on United Air Lines Accident at Fort Wayne, Ind.—(CAB 51-38) (May 4).

CAB Relieves Youth Argosy so as to Permit Carriage of Passengers to Europe who Bought Transportation on or Prior to March 23, 1951—(CAB 51-39) (May 8).

CAB Approves Los Angeles-Guatemala Service by Pan American—(CAB 51-40) (May 9).

CAB Sets Hearing on Collision Accident Near Key West, Fla.—(CAB 51-41) (May 10).

All American Airways Washington-Atlantic City Route Segment Extended to New York—(CAB 51-42) (May 15).

CAB Proposes Lower Mail Rates for Southwest Airways—(CAB 51-43) (May 17).

Nyrop Sworn in as CAB Chairman—(CAB 51-44) (May 18).

CAB Decides United States-Alaska Service Case—(CAB 51-45) (May 25).

Top Civil Aviation Officials Assume New Posts

Secretary of Commerce Charles Sawyer (right) is shown congratulating D. W. Rentzel immediately after the latter took the oath of office as Undersecretary of Commerce for Transportation.

Charles F. Horne (left) and Donald W. Nyrop felicitate each other after being sworn in as Administrator of Civil Aeronautics and Chairman of the Civil Aeronautics Board, respectively.

Civil Aviation Now Better Prepared To Render Vital Wartime Services

One of the great aims of the CAA is to protect and develop all civil aviation, and to use all of it to the best interests of the people of the United States in the event of war, Charles F. Horne, Administrator of Civil Aeronautics, said in an address last month before the Aeronautical Training Society in Washington, D. C.

"We are building our policies on the experience you and the CAA had in World War II," he said. "Few people feel that we used our civil aviation resources to the fullest advantage in that war. I am convinced that we are better prepared now to call upon our civilian planes and pilots for the variety of missions they can now perform."

"We are convinced that civil aviation should continue without restriction until the advent of war," the Administrator said, "and we are convinced that during war, under the proper security controls, civil aviation can render exceptionally valuable services. Thus wartime restrictions on any type of flying must be kept down to an absolute minimum."

Mr. Horne reviewed the report prepared by the Aviation Development Advisory Committee and cited some of the figures they produced. These include:

Sixty thousand non-airline aircraft on the active list and some half million trained personnel, the planes representing 191,839 seats for air travel—enough to carry about 12 divisions of troops without equipment—compared with the 48,279 seats simultaneously available on the airlines today; 5,000 civil airports ready for use; and innumerable civilian firms engaged in aerial mapping, aerial photography, patrolling power and pipe lines, and other types of flying, including over 5,000 planes in agriculture.

Emergency Services Invaluable.—"We are told that attack in any subsequent war will occur swiftly, possibly without warning," the Administrator said, "and that emergency services by aircraft will be essential and highly important. In the transportation of emergency aid, in the evacuation of injured, in the management of population movements, the civil plane and the civilian pilot will be invaluable.

"Beyond these emergency services to the civilian population, the civil fleet can render direct aid to the national economy and to the military forces. We learned that seats for essential travel on the airlines during the last war were always at a premium. Company planes, of which we now have some 8,000, will be busy—are busy now, in fact, hauling executives engaged principally in war work. The 10,500 planes now used by farmers will be busy in the production of food, fiber and wood crops. We find a relatively few planes used solely for pleasure flying, and in the event of a deep emergency, these also would be available for essential transportation."

Priority Assistance.—Mr. Horne discussed the request for the allocations of priorities for personal-type aircraft and the announcement that such planes would not be eligible for priority assistance. "Perhaps this occurred," he said, "because the term 'personal-type planes' does not clearly reflect the essential services performed by such planes. A plane used in protecting food crops against destruction by insects, a plane used in patrolling a power line, a plane used by a defense plant executive might technically be classified as a personal-type plane if it is owned by an individual rather than an aircraft service operator. We believe it is properly called a defense-supporting non-carrier plane, either executive, agricultural, or industrial. Such a plane has a real place in the nation's commerce, and I intend to press for recognition of this fact in the form of an amendment to the controlled materials plan.

"Meanwhile, a number of interesting developments are under way of special interest to you. The transport prototype testing program looks toward assisting manufacturers and airlines in bringing better transports into service, particularly jet-powered planes. The CAA is furnishing leadership in this program and the advisory committee consists of representatives of the CAB, all categories of airlines, the airline pilots, the manufacturers and the military. A total of $12,500,000 has been authorized. The committee has proposed the use of $1,750,000 for next year's work, when they hope to test the B–45 jet bomber, the Convair turboliner, and one large helicopter.

Local Service Plane.—"In the midst of this committee's work, a bill has been proposed in Congress aimed specifically at development, rather than just testing, of a local service plane. This bill would appropriate $8,000,000 as a sort of supplement to the transport testing legislation, but it would involve the design, construction and development of an aircraft suitable for local service airlines.

"Meanwhile, the Air Coordinating Committee has asked the CAA to give it a report on the helicopter and its adaptability to various forms of air transportation.

"We have a sizable record already of local cargo and passenger-carrying by helicopters. Some 4,000 passengers have ridden on the helicopters carrying mail from the main postoffice roof at Los Angeles to the airports and between various branch postoffices. With one helicopter now on the drawing board capable of carrying 70 passengers, and several in the 15-30 passenger capacity, it is certain that this type of vehicle will be seriously examined by those interested in the local service plane."

The Administrator brought out the various methods by which the fixed base operator could increase his business and mentioned the ways that CAA assists him. "The CAA considers the fixed base operator the backbone of non-airline aviation operations, and we devote a great deal of effort toward promoting this part of the business," he declared. "If you men have a financially healthy operation, the climate for all flying is improved."